The Astrolabe

Student Target
SS.4.A.3.1, SC.4.E.5.1

Materials
Copies of the below text and questions
Pencil or pen
Copies of the astrolabes for students to make with the materials listed on the astrolabe plan

Warm-up
In the 21st century, we use hi-tech navigation tools to travel on the world’s oceans. Some of these devices include Global Positioning Systems (GPS), which use orbiting satellites to track our position anywhere on earth.

During the Age of Discovery methods of navigation were very crude by today’s standards. However, mariner’s navigation tools did develop quickly because of the need of European explorers venturing to the New World discovered by Columbus in 1492. Some of the instruments early navigators used varied and included the quadrant, astrolabe, cross staff, hourglass, compass, map or nautical chart, and other devices.

Lesson
Read the following passage about the quadrant and astrolabe and then answer the questions.

The quadrant was a celestial navigation tool used to find latitude. It was a quarter panel of wood or brass with degrees marked on the outer edge of the arch, a plumb line, and sight along one edge. The instrument was used to measure the altitude of the star Polaris. The reading was taken where the plumb line intersected the degree on the outer edge of the arch.

Like the quadrant, the astrolabe was used to find latitude. It was a circle made of brass or wood with degrees on the edges and a moveable alidade or sighting arm. It could be used at night to sight in on Polaris to obtain the latitude. If the alidade had a sight with pinholes on either end, it could be used during the day by measuring the sun. The astrolabe was used by holding from the ring at the top and the sight moved until the sun shined through the pinholes. The degree was then read. If used at night, it was held by the ring with one hand, the other hand moved the alidade until it was sighted in on Polaris, then the degree was read. Sometimes the astrolabe was by a pair of sailors, one to sight and the other to steady the device and take the reading.
Questions
1. Sailors used the astrolabe to find what?

2. Is the alidade a non-moving sight or a movable sight?

3. Could sailors use the astrolabe during the day?

4. If sailors used the astrolabe at night, what star did they aim at to find the latitude?

Enrichment
Make your own astrolabe. Print the attached plan for an astrolabe and have students make their own navigation instrument.

Visit [www.museumoffloridahistory.com/education/resources.cfm](http://www.museumoffloridahistory.com/education/resources.cfm) to download the template of an astrolabe.

You can also visit the National Oceanic and Atmospheric Administration and download an astrolabe to make, at [http://oceanservice.noaa.gov/education/projects/makeyourownastrolabe.pdf](http://oceanservice.noaa.gov/education/projects/makeyourownastrolabe.pdf)

Have students follow the instructions to make their astrolabe, to use it, and to report their finding in class.

Vocabulary
Quadrant
Astrolabe
Alidade
Polaris
Answers

Questions
1. Sailors used the astrolabe to find what?

Latitude

2. Is the alidade a non-moving sight or a movable sight?

It is movable

3. Could sailors use the astrolabe during the day?

Yes, by using the sun.

4. If sailors used the astrolabe at night, what star did they aim at to find the latitude?

They would use the star Polaris.