Sextant Activity Guide **United # SXTNT1**

History: The sextant has been used for nautical navigation for over two centuries. Prior to electronic navigational systems, the compass and sextant were the primary means of navigation for sailors. Celestial navigation uses the position of objects such as the sun, moon, and stars to along with charts and almanacs to locate your position on the Earth. The sextant is used to determine the angle of a celestial object above the horizon.

A variety of devices such as the astrolabe and backstaff were used during the early years of navigation. Back-sight instruments, such as the backstaff, used shadows from the celestial object. While back sighting instruments worked well when using the sun for navigation, they were very poor under low light conditions such as sighting the moon, stars, and planets. John Hadley and Thomas Godfrey developed the forerunner of the sextant independently in the early 1700s. The sextant uses a double mirror system to produce an image of the object being sighted.

The primary use of the sextant is in navigation. However, it can also be used to determine the height of an object located a known distance away or the distance to an object of known height.

Use: The sextant is a precision instrument. Care must be used in handling the sextant at all times. Failure to exercise proper care will result in inaccurate readings.

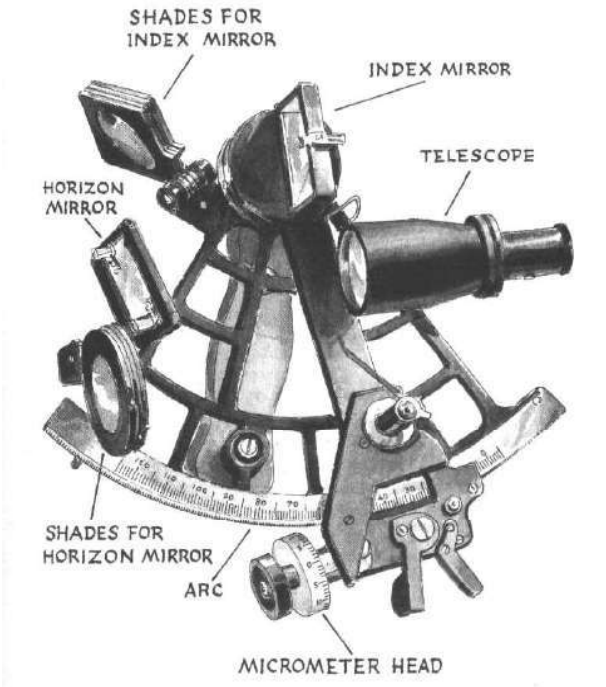

Figure 1

Hold the sextant upright as shown in Figure 1 above. The sighting tube should be parallel to the ground. Make sure the sighting angle on the angle scale is set to zero. Look through the sighting tube toward the horizon. Adjust the half-mirror near the base of the sextant (horizon mirror) so the horizon appears along the horizontal diameter of the mirror. Adjust the mirror at the top of the sextant (index mirror) so the reflected image of the horizon lines up with the actual horizon seen through the horizon mirror.

While holding the sextant level, move the index arm to sight to the desired object (such as a star). Move the arm until the object's image appears in the mirrored portion of the horizon mirror. Adjust the index arm until the object is centered on the actual horizon seen through the horizon mirror. See Figure 2 below.

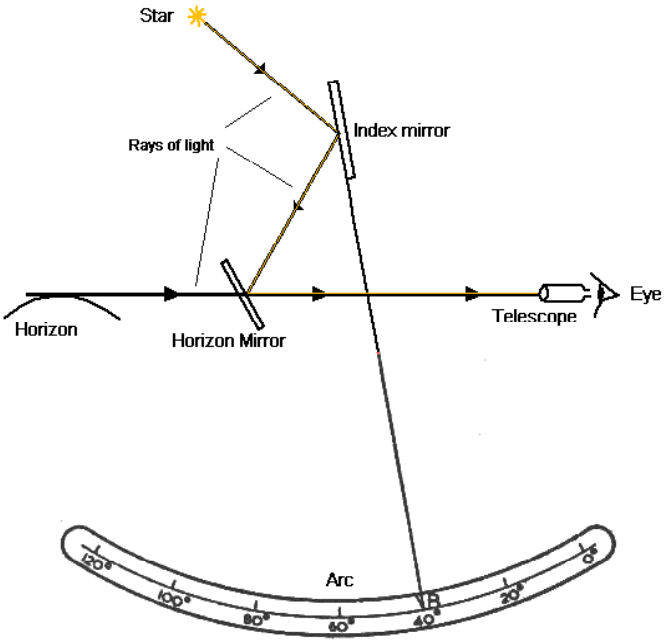

Figure 2

Read the angle to the nearest degree by observing the location of the zero mark on the Vernier scale. Next find the mark on the Vernier scale that lines up with an angle mark on the degree scale. This will give your additional measurement in minutes (1° = 60 minutes). Note: The Vernier scale uses 20 divisions per degree. Therefore each mark on the Vernier scale represents 3 minutes.

For example: The zero line on the Vernier scale is just past the 10° mark on the degree scale and the third mark on the Vernier scale lines up with one of the degree lines above it. The sighting angle would be 10 degrees and 9 minutes or 10.0° 9.0'.