How did sailors of centuries past find their way across the seas before the invention of the compass and the sextant? The earliest sailors followed the coastline as far as they could, using features on land to mark their location. But when their journey took them far from land, they relied on the sky.

Early sailors knew that the Sun rises in the east and sets in the west, and they used that knowledge to guide them. So if they sailed into the rising Sun, they knew they were heading east. If they turned to the right, putting the rising Sun on their left side, they knew that they were heading south.

At night, these ancient mariners steered by the stars. The North Star proved a stable marker in the Northern Hemisphere because Earth’s northern axis points to the North Celestial Pole (celestial means “dealing with the sky; heavenly”). The North Star, Polaris, is the star currently closest to the North Celestial Pole. As Earth rotates on its axis, the stars in the night sky seem to move in a circle, because they are fixed relative to Earth. But the North Star remains in one spot in the Northern Hemisphere sky at all times, and all the other stars seem to rotate around it. The farther north a sailor traveled in the Northern Hemisphere, the higher the North Star appeared in the sky. The farther south one sailed in the Northern Hemisphere, the lower the star appeared in the sky.

Many sailors of old used a handy tool to help measure precisely how high or low a star was in the sky: their fingers! By holding his arms straight out in front of him, a mariner laid his fingers on top of each other to measure the “height” of a star such as the North Star from the horizon. Because the height of Polaris above the horizon is equal to the latitude at a particular location, sailors could use the star to estimate their location. They would, for example, turn west or east once a particular star selected for navigation was two finger-widths above the horizon. Very clever!

Although the skies are still important in guiding ships, today’s sailors use computer and satellite technology – such as the Global Positioning System (GPS) – to guide their travels. Navigators have come a long way since the days of steering by the stars.

Constant as the North Star

As constant as it seems, Polaris, the North Star that we see in our night sky, has not always been our North Star. This is because Earth wobbles on its axis as it rotates, like a spinning top. While a top can make one complete wobble in a second, it takes Earth 26,000 years to complete one wobble – or precession. The means that Earth’s axis points to different stars over the centuries. For example, around 3000 BC, the North Celestial Pole pointed to Thuban, not Polaris.