



## Which Way Is North?

**T**he early voyagers used their knowledge of Earth, the oceans and the Sun, other stars, and the planets as their global positioning system. The early voyagers understood how the Sun, stars, and planets moved across the sky and with respect to each other and Earth's horizon. Their experience with and knowledge of wind, wildlife, waves, and ocean currents allowed them to guide a sailing vessel across vast expanses of open ocean.

**In this FACTivity, you will locate north, south, east, and west using only the Sun.**

You may know that, in general, the Sun appears to rise in the eastern sky and set in the western sky. In truth, Earth's rotation is what makes the Sun appear to rise and set. Because of changes to the Earth's tilt, or the direction of its axis, the Sun's rising and setting appear at a slightly different spot on the horizon every day. On the equinoxes, the Sun rises directly in the east and sets directly in the west. On these days, the length of day and night are equal around the

world. The spring equinox happens around March 20, and the autumn equinox happens around September 20. You can check the internet for the exact day each year. In the Northern Hemisphere, the longest day is around June 20 and the shortest day is around December 20. In the Southern Hemisphere, the longest day is around December 20 and the shortest day is around June 20. These days are called the summer and winter solstices. The sun's position on the horizon will move on either side of true east and true west, depending on the season.

To find north, you will begin by facing the Sun in the morning (towards the east) or in the evening (towards the West) as it passes the horizon. The closer the day's date is to either equinox (March 20 or September 20), the closer the Sun will be to true east or true west. The closer the date is to either solstice (winter or summer), the farther the sun will be from true east or true west. Therefore, to find north as accurately as possible, you will have to think about what season it is.

### First determine the date of today.

Use the setting Sun for this FACTivity. You will probably need to do this activity for homework. As the Sun drops toward the horizon at sunset, stand and face the Sun. Next, you will be turning your entire body slightly either to the left or right. To get a feel for how much you will need to turn your body, raise one of your arms straight out to the side. Imagine that the Sun is at 12 o'clock in front of you. If you raised your left arm, imagine that it is pointing towards 9 o'clock on your left. If you raised your right arm, imagine that it is pointing towards 3 o'clock on your right. You will be turning your body in one or the other direction, facing either an imaginary 11 o'clock on your left or an imaginary 1 o'clock on your right.

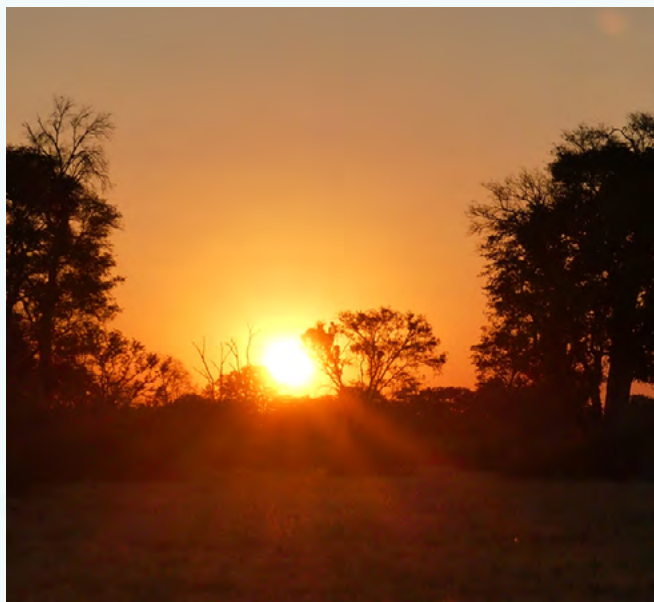


Photo courtesy of Luci and Mark Ginsberg.

If you are in the Northern Hemisphere (north of the Equator), you will adjust your body as follows:

- March 22 to September 19, turn slightly left as if facing 11:00
- September 20 or 21, do not move
- September 22 to March 19, turn slightly right as if facing 1:00
- March 20 or 21, do not move

If you are in the southern hemisphere, you will adjust your body as follows:

- March 22 to September 19, turn slightly right as if facing 1:00
- September 20 or 21, do not move
- September 22 to March 19, turn slightly left as if facing 11:00
- March 20 or 21, do not move

You are now facing either directly or very close to due west. This direction may not be exactly where the Sun is setting, depending on the season. Notice a landmark straight in front of you. Now, raise your right arm straight out to the side once more and point your finger. You are pointing either due north or very close to it. Notice a landmark and memorize it. Turn and face due north. South is at your back, west is on your left, and east is on your right. Notice other landmarks at east and south. You now know the four directions from this location.

You have just located the four directions using the Sun. You can do this anywhere on Earth at sunset to locate the four directions.

**Discussion: How do you think this method of finding north is similar to and different from the methods used by the early ocean voyagers? Name at least two similarities and two differences.**

## Web Resources

Polynesian Voyaging Society

<http://www.hokulea.com/moananuiakea/>

Waa'gey

[www.waagey.org](http://www.waagey.org)

Micronesian Voyaging Society

<https://sites.google.com/site/alinganomaisu/home>

Waan Aelon n Majel:

[www.canoesmarshallislands.com](http://www.canoesmarshallislands.com)

Samoa Voyaging Society:

[www.svs.wendymorrison.com.au](http://www.svs.wendymorrison.com.au)

The World Wide Voyage

<http://www.hokulea.com/worldwide-voyage/>

Palau National Marine Sanctuary

<https://www.pewtrusts.org/en/research-and-analysis/articles/2020/01/01/palau-national-marine-sanctuary-goes-into-effect>

