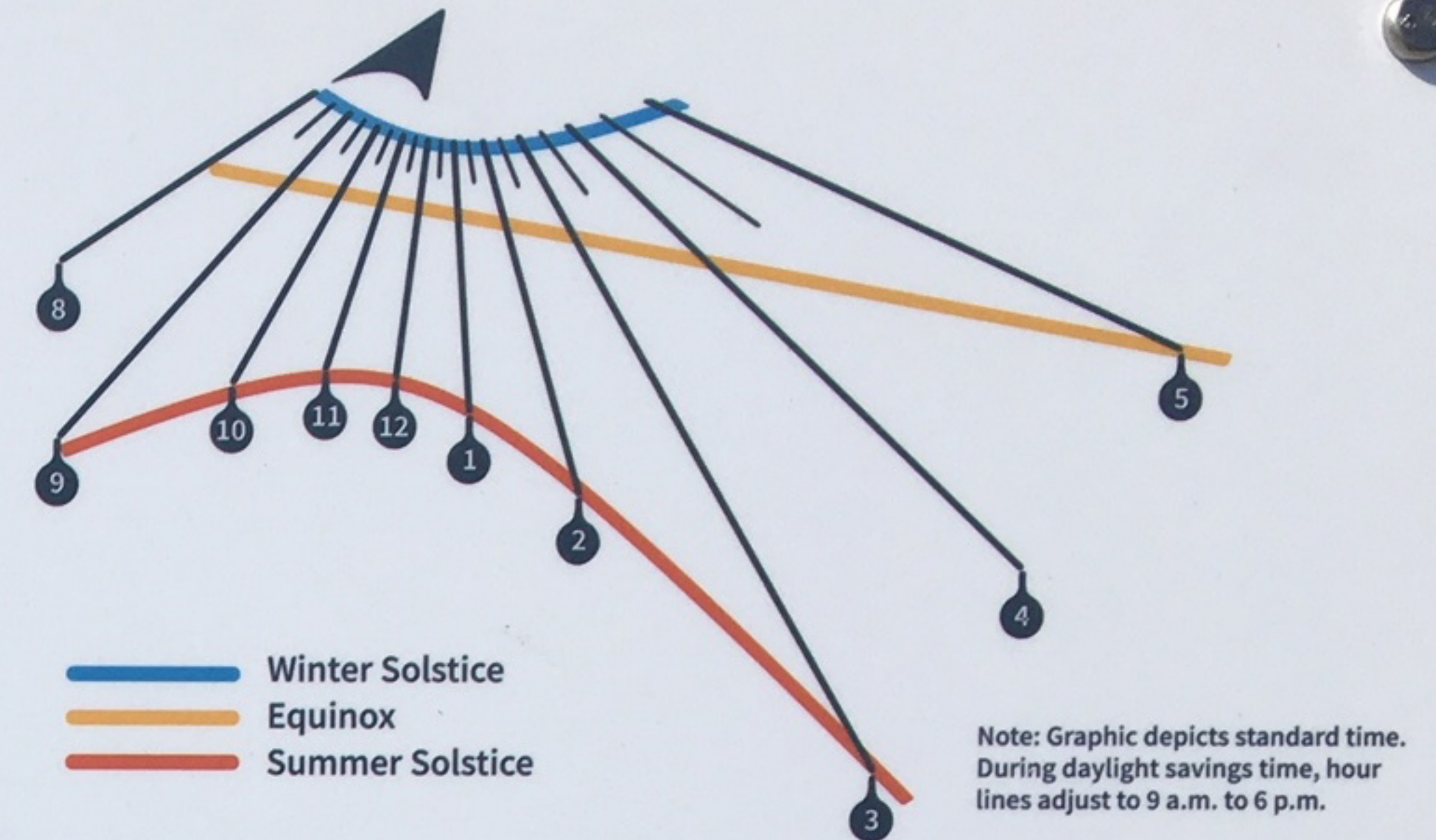
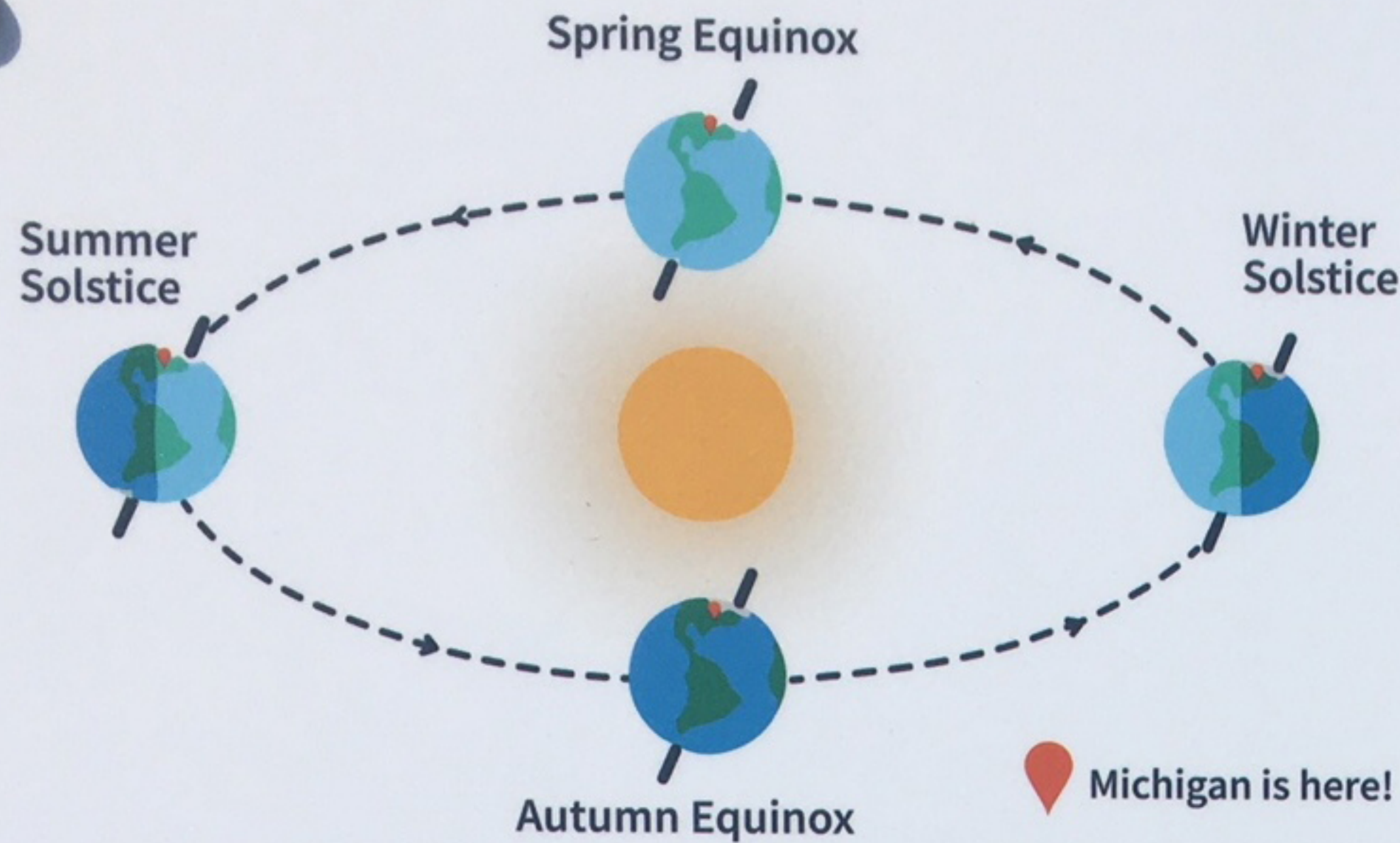




MEASURING TIME

Because Earth's orbit around the Sun is an ellipse and not a circle, its speed around the Sun changes as it passes through different parts of its orbit. This causes shadows to move slightly faster or slower during different times of the year—a measurement called Apparent Solar Time. Sundials help us determine Apparent Solar Time, while clocks run at a constant speed all year and reflect Mean Solar Time.

The difference between Apparent Solar Time and Mean Solar Time can make a sundial's reading appear up to 16 minutes fast or slow when compared to a clock. We can correct this discrepancy by using the table below, which indicates the +/- minute correction referred to as the equation of time.

SEASONS

The Earth has seasons because its axis of rotation is tilted. The Northern Hemisphere is tilted toward the Sun for about half of the year and tilted away from the sun for the other half, causing summer and winter.

READING A SUNDIAL

Sundials use the movement of shadows to determine the time of day. As the Earth rotates on its axis, the sun appears to move across the sky from East to West causing shadows of objects to move from West to East. The pointed triangle at the top of the sundial is called a gnomon. When the gnomon's shadow crosses an hour line, we can determine what time it is *to the half hour* between 8 a.m. and 5 p.m. (or 9 a.m. and 6 p.m. during daylight savings time).

The blue arc at the top of the sundial marks the Winter Solstice—the year's shortest day—when the Sun reaches its lowest point of the year. On the Winter Solstice, the gnomon's shadow will only reach the winter solstice line.

The long red arc along the bottom of the sundial marks the Summer Solstice—the year's longest day—when the Sun is at its highest point of the year. On the Summer Solstice, the gnomon's shadow reaches all the way to the Summer Solstice line.

The straight golden line is the Equinoctial line, which marks the Spring and Autumn Equinox. The length of daylight and darkness are equal on both the Spring and Autumn Equinox.