## In-class activity 3

## Assemble Your Group

1. Find your assigned group members, and sign in below.

Team member:

Team member: \_\_\_\_\_

Team member: \_\_\_\_\_

Team member: \_\_\_\_\_

## Paths of the Sun

2. Cf. Seeds and Backman, *ASTRO3*, Brooks/Cole Cengage Learning (2018), p. 23, Fig. 2. The highest and lowest paths of the sun in June and December, respectively are shown for the San Luis Obispo, CA sky. Write/draw in your group's answers for the following questions.<sup>1</sup>



- (a) The *fall equinox* is in September, halfway through the year between June and December, when the sun rises due east and sets due west, and there are exactly 12 hours of daylight. What month is the *spring equinox* in?
- (b) For the two equinox months, draw in the path of the sun from rise to set, and write in the number of daylight hours on the diagram above.

<sup>&</sup>lt;sup>1</sup>Adapted from Adams, Prather, and Slater, *Lecture-Tutorials for Introductory Astronomy*, *l/e*, Addison-Wesley (2005), pp. 19-22.

- (c) If the sun rises between northeast and east in a certain month, how many months later will the sun rise between east and southeast?
- (d) If the sun rises between northeast and east in a certain month, how many months later will the sun next rise again between northeast and east?
- (e) If the sun rises due east in a certain month, how many months later will the sun next rise again due east?

## The Changing Seasons

- **3**. Students at the Overland Trail Middle School in Overland Park, KS composed *haiku* poems explaining what causes Earth's seasons change.<sup>2</sup>
  - (A) The seasons exist Winter, spring, summer, through fall Because of the sun.
- (C) We know seasons change Due to our Earth's rotation That's why seasons change.
- (B) Summer occurs when
  Earth is farthest from the sun
  It is hot and dry.
- (D) Earth's tilt is constant But the seasons can still change Orbiting the sun.

Decide which three of these *haiku* poems (A)-(D) do *not* explain what causes Earth's seasons to change. Explain the reasons for your choices below.

Explanation:

<sup>&</sup>lt;sup>2</sup>M. A. Bogina, B. R. Roberts, "The Use of Haiku and Portfolio Entry to Teach the Change of Seasons," *Journal of Geoscience Education*, vol. 53, no. 5 (November 2005), pp. 559-562. Some poems have been edited for the purposes of this activity. (nagt.org/files/nagt/jge/abstracts/bogina-v53n5.pdf)