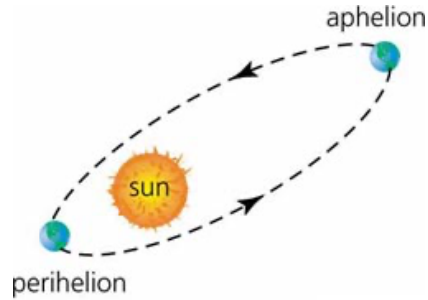


Happy Perihelion



<https://fretzreview.wikispaces.com/Seasons-Causes+Group+1>

On Saturday, Jan 2nd, 2021 at 8:50 am EST (1:50 pm UTC), Earth will be as close to the Sun as it ever gets during the year. This is called Earth's perihelion.

So, at this coldest time of the year in the Northern hemisphere, we Earthlings will be at a distance closest to the Sun.

1. Does that fact make sense to you? Why or why not?

2. If January 2nd is when we are closest to the Sun, does it seem that seasons on the Earth are caused by our nearness to the Sun? Can you explain this?

Since the Earth's orbit around the sun is elliptical, the distance from the Sun to the Earth is not always the same. Astronomers have calculated an **average** distance from the Earth to the Sun which is called one astronomical unit = 1 AU.

The average distance to the Sun is calculated to be 149,597,870.7 kilometers.

3. One kilometer is 0.621371192 miles. What is the *average* distance to the Sun, 1 AU, in miles?

4. Can you describe the distance to the Sun relative to some distance that you understand?
 - For instance, a trip to Alaska from Boston is more than 3,000 miles.
 - The distance around the Earth is about 25,000 miles.

You could describe how many trips to Alaska from Boston you would have to make; trips around the Earth you would need; or something else; to equal the distance from the Earth to the Sun.

On Saturday, when the Earth is at its perihelion, we will be about 91,399,454 miles from the Sun.

5. In both kilometers and astronomical units, how far will the Earth be from the Sun on its perihelion?

The Earth will be at its furthest from the Sun on Monday, July 5th, 2021 at 6:27 pm EDT (10:27 pm UTC). This position is called its Aphelion. The Earth will be about 1.0167 AUs on July 5th.

6. How far will the Earth be from the Sun on its Aphelion?

a. In kilometers?

b. In miles?

7. In kilometers, miles, and AUs, how much closer is the Earth to the Sun at its Perihelion than its Aphelion?

8. Describe this difference as a comparison with the distance that you used in problem # 4.

9. If you ever wanted to visit the Sun, this is as close as we get, so you may want to get going. Approximately how long will it take each of the following to reach the Sun leaving around January 3rd? (I guess we would need an amazingly heat resistant vehicle.)

Object and Speed	Time to Reach the Sun
School bus going 40 mph	
Traveling in your parents' car at 70 mph	
Airplane traveling 600 mph	
Space Station or other space craft traveling 17,500 mph	
An object any "n" miles per hour	

10. About how much longer would it take for a space vehicle, traveling at 17,500 miles/hr, to reach the Sun during Aphelion than perihelion? Show or explain your solution method. Is there more than one way to find this solution?

Sources:

<https://www.timeanddate.com/astronomy/perihelion-aphelion-solstice.html>

<http://www.astropixels.com/ephemeris/perap2001.html>

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