

Winter Solstice for Young Scientists

You might know that the first day of winter is winter solstice. You might also know that the winter solstice is the shortest day of the year. But did you know that the sun can make you a bigger person on the winter solstice?



Young people in Montreal, Canada wave to their shadows on the winter solstice. (Photo: Owen Rose)
<http://www.learner.org/jnorth/pde/fall2009/Update120109.html>

Starting in early December, keep track of day length by watching the local evening news or by going on-line to a website such as www.sunrisesunset.com or www.timeanddate.com. If the length of day is not listed, subtract the time of sunrise from the time of sunset. If the sunset time is listed as P.M., add 12 to the hour to get military time, then you can more easily do the subtraction. Keep a log of date and day length. Continue to record the date and day length for a few weeks into January.

Also starting in early December, go outside at noon and stand in a sunny spot. Have someone measure the length of your shadow. In a notebook, write down the date and how long the shadow was. On all the sunny days that you can, go outside at noon to the same place and have someone measure your shadow. Keep track of the date and length in your notebook. Continue to do this for a few weeks into January.

What happened to the length of daylight over time? What days did it increase? What days did it stay the same? What days did it decrease?

What happened to your shadow over time? What days did the shadow get longer than the previous day? What days did it stay the same length? What days did it get shorter?

When you look at the calendar for December, you will see that the winter solstice is Dec. 21 or 22. Did your measurements for day length correspond to the winter solstice? What day was your shadow the longest? If you were to define the winter solstice using your shadow, how would you define it?

To see why the length of your shadow changes, find a strong flashlight and a glue stick or other small cylinder. Place the cylinder upright on a table or the floor. Shine the flashlight straight down onto the cylinder. How long is the shadow? Move the flashlight a few inches to one side and shine the light onto the cylinder. How long is the shadow? Hold the flashlight almost parallel with the table. How long is the shadow? If you think of the sun as a big flashlight, it will cast a longer shadow when it is lower in the sky. Can you define winter solstice in terms of the sun's position in the sky?

However you define it, winter solstice is one of the coolest days of the year!



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