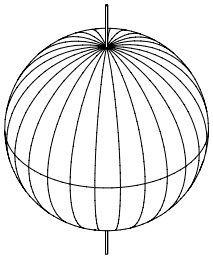
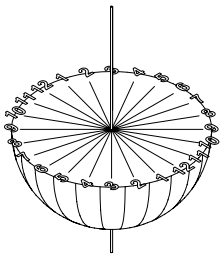
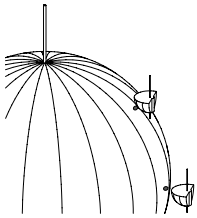
The Equatorial Sundial



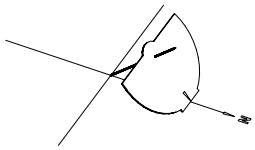
The equatorial sundial is one of the simplest sundials to understand and make for yourself. Its name comes from the equator. Imagine the earth on a long rod running through both poles. The earth would spin around completely once per day, so each hour it would spin 1/24 of a complete turn. If you cut the earth in half along the equator and wrote the numbers 1 through 24 equally around the outside of the earth, you would have a basic equatorial sundial. The shadow cast along the outside edge by the rod would tell you what time it was.



This works great at the equator, but how about in Arlington? We can do the same thing; we just need to bring the equator up to us! Since this is impossible, what we need is a model. The paper sundial is a model of half the earth cut at the equator. The stick comes through the center of the sundial like the rod comes through the center of the earth. If we hold the sundial so stick is parallel with the imaginary rod, pointing exactly the same direction, it will tell time the exact same way.



Here comes the tricky part. If you stand on the equator, the face of the sundial would be on its edge, and the rod would point flat along the ground. In Arlington, where we are almost 1/2 of the way between the equator and the North Pole, the face of the sundial needs to be at an angle to the earth for the stick to be parallel with the imaginary rod. The angle the stick makes with the ground is the same as the angle Arlington makes with the equator, 42.41°.



Here's how to make and use your own equatorial sundial. Cut out the provided paper sundial. Take a straight stick, like a bamboo skewer, and mark a point 5 ½" inches from one end using the scale on the front of the sundial. From the back, push the stick through the center hole on the sundial only as far as the mark on the stick. Take the sundial outside and set it down on a flat, sunny surface. Turn the sundial until the line from the end of the stick to the middle of the sundial points north, then read the time. Even easier is to get the correct time from a clock and then set the sundial down and turn it until the shadow from the stick points to the correct time. The stick will then be pointing north, and the sundial is positioned correctly.

Additional Sundial Resources:

General Sundial Information

- Sundials on the Web
  (http://www.sundials.co.uk/)

Equatorial Sundials

- Educator's Guide to Equatorial Sundials
  (http://www.wsanford.com/~wsanford/exo/sundials/equatorial_sundials.html)
- The Equatorial Sundial
  (http://perso.orange.fr/blateyron/sundials/gb/equat.html)
- The Sundial Primer
  (http://www.mysundial.ca/tsp/equatorial_sundial.html)

Analemmatic Sundials

The Friends of Robbins Farm Park is researching the construction of a sundial at the park. The most likely design would be an analemmatic sundial, where the dial face is flat on the ground and the user serves as the pointer or gnomon.

- Analemmatic Sundials: How to Build One and Why They Work
  (http://www.analemmatic.com/documents/op.pdf)

Finding True North

True north and magnetic north are not the same. A compass points towards the magnetic north pole, which in Arlington, is 15.27º west of true north.

- NGDC Magnetic Declination Page
  (http://www.ngdc.noaa.gov/seg/geomag/declination.shtml)

Solar Noon

If you use your sundial for a while, you may notice that it doesn't keep completely accurate time. This is because the sun's position in the sky at noon isn't always the same. Solar noon is the actual time when the sun is due south.

- A Solar Noon Calendar
  (http://www.solar-noon.com/)