

Ancient Eyes Looked to the Skies



Sunwatchers of the Southwest

Activity Units in Archaeoastronomy
developed at
Chabot Space & Science Center
Oakland, California

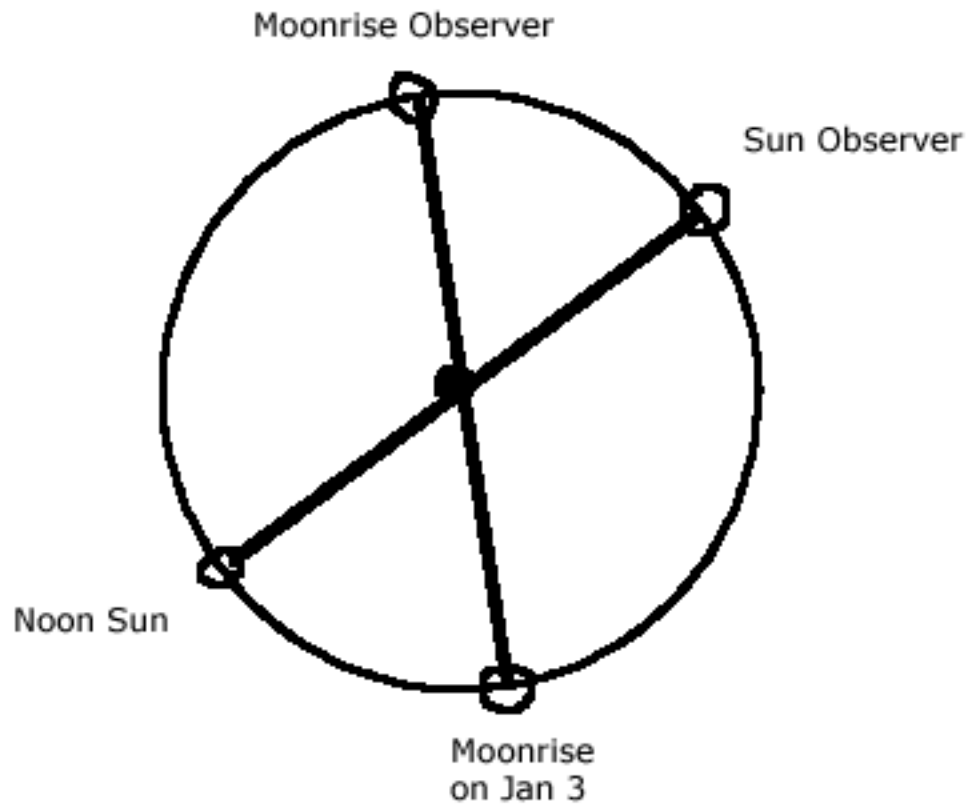
Activity 1: Schoolyard Medicine Wheel

Activity: Make a schoolyard “medicine wheel” with sidewalk chalk on playground asphalt.

Objective: Learning the basics of the horizon, direction, and the risings and settings of Sun and stars.

Connection: The prehistoric Plains people of North America moved around a lot, following the bison and deer they hunted. Since they were always on the go, they didn’t built permanent buildings of stone, as the ancient Pueblo peoples did. This means that they didn’t leave behind much archaeological evidence for us to learn about them by. One thing they did build that can be found today are the circles of stone called “medicine wheels.” For a long time, we didn’t know what the medicine wheels had been built for, but a careful investigation has taught us that they may have been a calendar system based on observations of objects in the sky.

Materials: A flat area at least 20 feet across—preferably asphalt or concrete—that has a good view of the sky; sidewalk chalk; string.



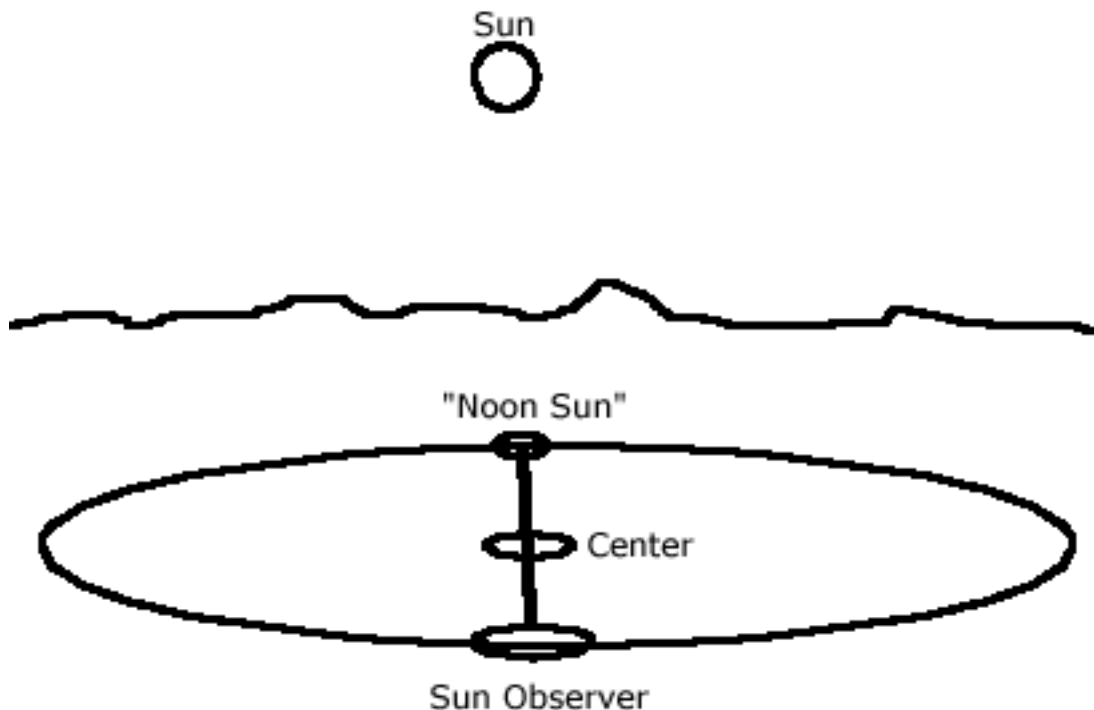
Building the Wheel

Read all directions before you start.

Activity 1: Making the Circle:

1. Decide how big you want your Medicine Wheel to be. If possible, make the wheel at least 20 feet in diameter.
2. Cut a piece of string to a length equal to the radius of the wheel (half the diameter). Be sure to leave a little extra string for tying.
3. Tie a piece of sidewalk chalk to one end.
4. Have one partner hold the end of the string without the chalk where the center point of the wheel will be, and another partner will pull the string tight and walk around the center, drawing the circle's perimeter as he/she goes.
5. Also mark the center of the wheel with chalk.

Activity 2: Marking the Noon Sun:



1. At noon, at least three students come out to the Medicine Wheel with the string and the chalk. Untie the chalk, separating it from the string.
2. One student is the Observer. The Observer stands on the edge of the circle on just the right spot so that the Sun is directly above the marked center of the wheel. It may help to draw an imaginary vertical line with a hand from the Sun straight down to the center of the wheel. If the center of the wheel is not directly below the Sun, the Observer moves along the circle to a position where it is.

3. Another student is the String Stretcher. The String Stretcher gives one end of a piece of string, which is equal in length to the diameter of the wheel, to the Observer, then takes the other end across the wheel and stretches the string tight.
4. The String Stretcher moves the string until it crosses directly through the center of the wheel, then stands in that position on the wheel.
5. A third student is the Line Drawer. The Line Drawer takes a piece of sidewalk chalk and draws a straight line across the wheel—from the Observer to the center and then to the String Stretcher—following the line of the stretched string.
6. The Line Drawer draws a smaller circle around the Observer's feet and labels this position "Observer of Noon Sun." The Line Drawer draws a smaller circle around the String Stretcher's feet and labels this spot "Noon Sun."
7. This completes one "spoke" of the Medicine Wheel: the spoke showing the direction of the Sun at noon.

Question: What direction (north, south, east, west, northeast, southwest, etc.) do you think this spoke points to?

Marking the Sunrise/Sunset Directions:

If it were possible for students to come and mark the directions of sunrise or sunset, they would do it in the same way as the noontime Sun direction, forming more spokes. Don't forget to label them!

Question: What direction(s) do you think the sunrise or sunset spokes point to?

More Spokes to Mark:

If students can't come back to the school at sunrise/sunset, other spokes can be added anyway. Here are some suggestions:

Equinox sunrise and sunset: Around the Fall and Spring Equinoxes (September 22nd and March 21st), the Sun rises directly east and sets directly west. You can mark these two directions by either using a magnetic compass or by drawing a spoke across the center of the wheel that is perpendicular to the line that was drawn for the Noon Sun. Draw and label these spokes.

North Star: The North Star, named Polaris, is located near the "North Celestial Pole," and never moves from its position; it's always directly northward. Mark the direction of Polaris by making a spoke on the wheel that is exactly opposite the spoke you made for Noon Sun. Label it "North Star." (The *correct* way to do this, of course, is to come out at night, find Polaris, and draw the spoke by sighting, as was done for Noon Sun.)

Moon: Depending on where the Moon is, spokes pointing in the direction of the rising or setting Moon can be added. When you make a spoke for a moonrise or moonset, be sure to label it clearly and include the time and date.

Star Risings or Settings: If students can come back at night (or better yet, if the class, lead by the teacher, can hold a "star party" around the Medicine Wheel), then spokes can be added for the risings and/or settings of bright stars that can be identified near the horizon. Make spokes for the risings and/or settings of some bright stars—or as close to

rising and setting as possible. Label each spoke with the name of the star and include the date and time. Some suggested stars (which someone will have to research in order to find and identify) are: Aldebaran, in Taurus; Spica, in Virgo; Vega, in Lyra; Altair, in Aquila; Betelgeuse, in Orion; Antares, in Scorpio; Arcturas, in Bootes; Sirius, in Canis Major (brightest star in the sky).

Questions:

- What do you think is the purpose of a medicine wheel?
- In what ways can the Medicine Wheel be used to tell directions?
- Can the medicine wheel be used to tell the time of year? How?
- If you were to create a more permanent medicine wheel, how would you build it, what would you build it from, how big would you make it, where would you put it?