# DAYTIME ASTRONOMY

These Daytime Astronomy Activities introduce students to a series of astronomical observations and activities during the day while they are at school. They lead to students doing their own night-time observations at home.

## DRAW MY SHADOW

*Required:* chalk, students, sunny day, paved area outside.



At 9.30 a.m. on a day that is likely to remain sunny, take the group outside to an open paved area clear of any trees and buildings that may cast shadows in that area later. Working in pairs, the students draw with chalk around each other's shadows and their shoes (so they can stand back in the same position later). The students should print their names and the time on their shadow outlines.

At 10 a.m. the students should stand back in their shoe outlines, draw around their shadows again and record the time.

Repeat this activity at 10.30 and discuss possible reasons why the shadows change. Get each student to draw a circle on the ground where they guess the shadow of their head would be at 11 o'clock.

At 11 the students should stand in their shoe outlines again to see how close the shadow of their heads were to their guesses. Draw around their shadows again.

It is likely that the students will want to keep recording their shadows hourly until later in the day. Then ask them to draw a line connecting the top of the shadows of their heads. The point along the line where the shadow would have been shortest was when the sun was halfway between sunrise and sunset and was on the meridian for your place. This was the time of solar noon*. All shadows cast at solar noon point to the true North Pole.

### Working out solar noon from the Weather section of a daily newspaper.

From sunrise and sunset times e.g.:-**Sunrise 6:44 a.m. Sunset 6:02 p.m.** work out the time of solar noon by using this method: From 12 noon subtract sunrise time (e.g. 6:44 a.m.) and add sunset time (e.g. 6:02 p.m.). **Important: Remember to calculate in hours and minutes.**

$$12:00 - 6:44 = 5:16 + 6:02 = 11:18$$

There are therefore 11 hours and 18 minutes of sunlight for this day.

Divide your answer (i.e. 11:18) in half (5:39), and add it to the sunrise time (i.e. 6:44).

$$11:58 \div 2 = 5:39 + 6.44 = 12:23.$$

Therefore 12.23 p.m. is solar noon in this example.

**Note:**

*There are two noons every day. 'Clock' noon (12 o'clock) and Solar noon when the sun is half way in time between sunrise and set at your location.

Identifying solar noon and shadow direction (true north) are critical for most of the other following activities.

Discovering that there is such a daily event as solar noon and that all shadows at this time point to the North Pole will be new to most students and teachers.