

Activity Instructions

The following items will be needed for this activity:

per group:

- chalk
- hula hoop
- watch

Step 1

On the first day, arrive at the sundial location with all the equipment 30 minutes before the first allocated time. For example, arrive at 9:00 a.m. if you are planning on marking the time starting at 9:30 a.m. If the hula hoop is to be shared between the whole class, then arrive at the sundial location even earlier.



Figure 1

Step 2

Have students pair up. Have one student hold the hula hoop in place while the other traces around the outside of the hoop using chalk (**Figure 1**).

Step 3

Ask one student to stand in the middle of the circle while the other makes an outline of his or her feet with the chalk (**Figure 2**). The student in the middle of the circle will stand in this same location for all the other steps. This is to ensure that the students are facing in the same direction throughout the activity, allowing them to see how the shadows change in length and position during the day.



Figure 2

Step 4

Mark the location where the shadow intersects the circle (**Figure 3**). Trace the outline of the whole shadow (**Figure 4**) and label it with the time.

Step 5

Return a few hours later in order to trace the outline of the shadow at a different time, e.g. 12:00 p.m. (**Figure 5**). Arrive 10-15 minutes before the hour so that the students can set up.

Step 6

Repeat Step 5 for a different time, e.g. 3:00 p.m. Again, arrive at the sundial 10-15 minutes before the hour.

Step 7

By the end of the day, each pair of students should have three outlines drawn on their sundials. They should be of varying lengths and in different positions, providing students with a visual of the sun's apparent movement in the sky.



Figure 3



Figure 4



Figure 5

Step 8

Predict where the shadows will be at other times, e.g. 8:00 a.m., 10:00 a.m., 11:00 a.m., 1:00 p.m., 2:00 p.m. Mark predictions of where the shadows will intersect the sundial (hula hoop circle).

Step 9

On the second day, return to the sundial location 10 minutes before each predicted time. Mark the actual position of the student's shadow at these times and trace around the student. If desired, use different coloured chalk to mark the position each day.

Step 10

Compare the predictions to the actual positions.

Step 11

On the third day, have students check whether their completed sundial (**figure 6**) works. To do this, return to the sundial every hour to see whether the shadow is cast in the same position as on the previous days.

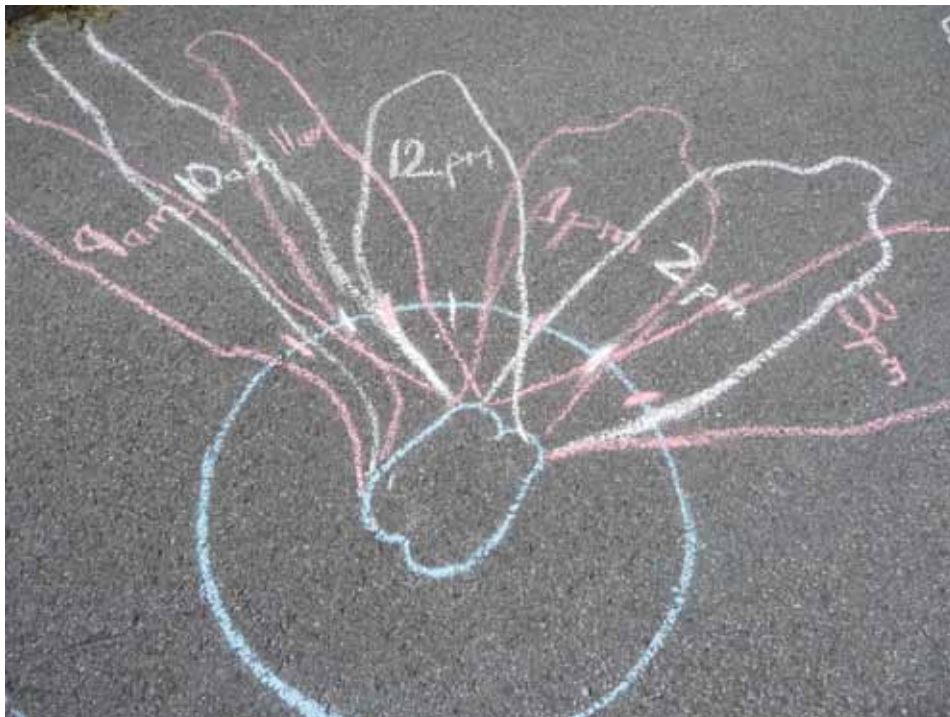


Figure 6