

# THE LAUNCESTON PLANETARIUM

QUEEN VICTORIA MUSEUM

## MAKING A SIMPLE SUNDIAL

For a very long time, people have told the time using sundials. They show the time by the position of a shadow. There are many different types of sundials. In this activity you will learn to make a simple sundial, called a horizontal sundial, that can be used to show the time. You will need some glue, a computer printer, scissors and two pieces of cardboard - one about 30 cm on each side and the other about 15 cm on each side.

### THERE ARE TWO MAIN PARTS TO YOUR SUNDIAL

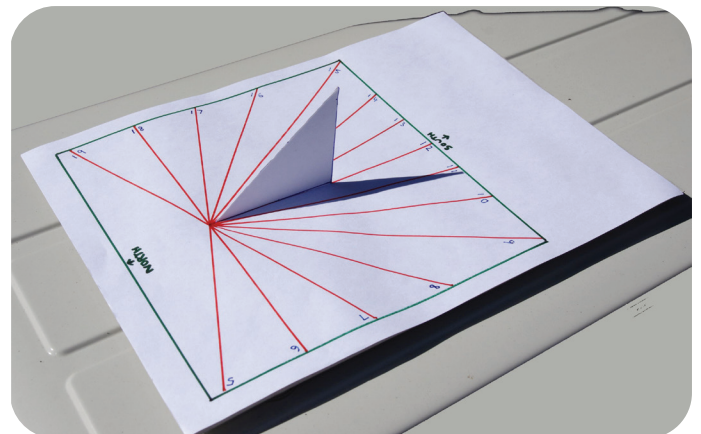
The larger part is the horizontal base, onto which hours are marked. The smaller one is the vertical, triangular part, called a gnomon, which is used to cast a shadow.

The positions of the hour (and half hour) lines on the supplied base on the page after next are correct for Launceston, Tasmania, but the sundial could be used in other parts of Tasmania and still work fairly well.

### HOW TO MAKE YOUR SUNDIAL

1. Print out the base and gnomon on sheets of A4 paper.
2. Cut out the square base and the triangular gnomon (including the rectangular part at the bottom of the triangle).
3. Cut pieces of cardboard to exactly match the shapes of the base and gnomon, and glue the paper shapes to the pieces of cardboard.
4. Using a sharp knife, cut a slot about 1mm wide in the base. The green line on the base shows where to cut.
5. Insert the gnomon into the base (through the slot), taking note of the north direction marker on the gnomon, which needs to point toward the north edge of the base. The gnomon must be upright.

A complete sundial, very similar to this one, should look like this!



*A complete sundial in use on a sunny day. It reads 10.50 am, but a correction must be made (see the information on next page). On this sundial, only the hour lines are marked, not the half hours.*

The bottom of the gnomon will poke through the base, but you may like to add some supports at each corner of the base to raise it, or cut off some of the protruding part. To hold the gnomon upright, it may help to glue two small pieces of cardboard on the base, next to the gnomon, to stop it leaning over.

To use your sundial, make sure that the 12 o'clock line points exactly south. You can find south from your house by using a map – perhaps a map that you can find on the internet. Or you can start by placing the sundial so that it reads correctly, then watch the time change!

## FINDING THE TIME USING YOUR SUNDIAL

Firstly, note the position of the shadow of the sloping part of the gnomon. The hours are marked for each full hour and half hour. Note that 13 = 1 pm, 14 = 2 pm, and so on. In the picture shown, the shadow is falling on about 10.50 am.

Secondly, you need to add or subtract minutes from the time shown on the sundial. This is because of your exact position on Earth, the Earth being somewhat tipped over, and the Earth's oval-shaped path around the Sun.

**Find the nearest date to the current date in the list below and add (+) or subtract (-) the number of minutes shown.** The sundial in the picture was operating on April 1, so the actual time was 11.06 am (10.50 am plus (+) 16 minutes). These corrections apply to Launceston, but they are very similar elsewhere in Tasmania.

1 Jan + 15	16 Mar + 20	1 Jun + 9	16 Aug + 16	1 Nov - 5
16 Jan + 21	1 Apr + 16	16 Jun + 12	1 Sep + 12	16 Nov - 4s
1 Feb + 25	16 Apr + 12	1 Jul + 15	16 Sep + 7	1 Dec No change
16 Feb + 26	1 May + 9	16 Jul + 17	1 Oct + 1	16 Dec + 7
1 Mar + 24	16 May + 8	1 Aug + 18	16 Oct - 3	

## THERE ARE MANY KINDS OF SUNDIALS

Ours must be placed flat (horizontally), but some can even be seen on the walls of houses, and some have shadows that appear on curved surfaces.

The one pictured below is the world's largest. It is in Jaipur, India, and was built in the 1720s or 1730s.



Image: Martin George

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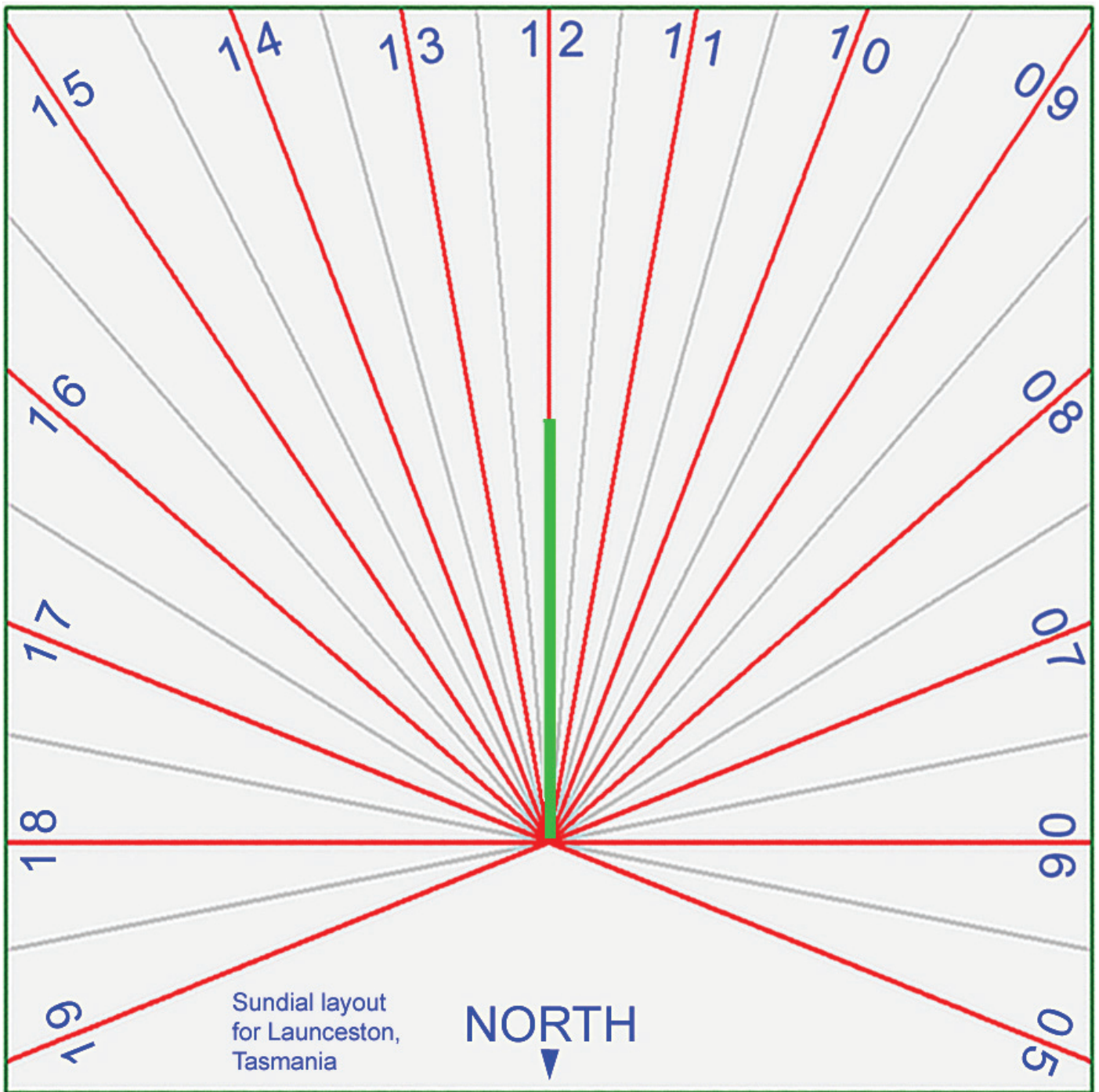
## PRINT PAGE – ONE

THIS IS THE HORIZONTAL BASE OF THE SUNDIAL

Print it, cut it out, and glue it to a firm piece of cardboard.

Don't forget to cut a slot where you see the thick green line!

You will poke the bottom of the gnomon through the slot.



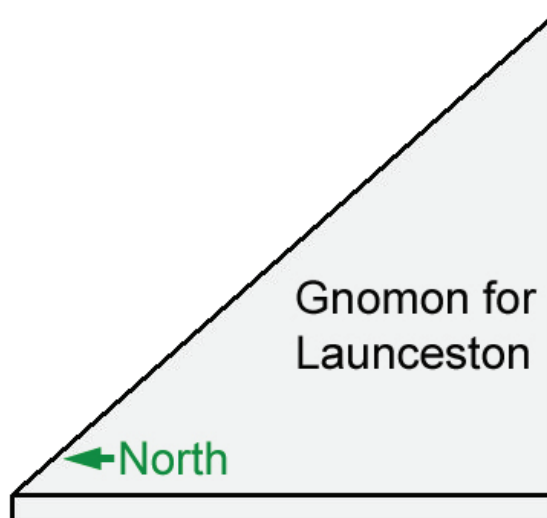
## PRINT PAGE – TWO

### THIS IS THE SHADOW-CASTING GNOMON

It is shaped correctly for Launceston, Tasmania.

Print it, cut it out, and glue it to a firm piece of cardboard the same shape.

The gnomon is placed into the slot that is cut in the sundial base, shown by the green line.



**NOW YOU JUST NEED  
THE SUN AND YOU CAN  
START TELLING THE TIME!**



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