

**Shedding Light on the Sun and Earth Episode 3: Following the Sun** Name: \_\_\_\_\_

Part A

- The sun rises in the general direction of \_\_\_\_\_, gets to its highest angle above the horizon in the middle of the day and then sets in the general direction of \_\_\_\_\_.
- Why are shadows (of trees, for example) longer in the morning and in the evening than they are in the middle of the day? \_\_\_\_\_

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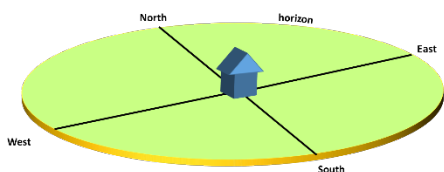
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Part B

- What is solar noon? \_\_\_\_\_
- Mark in (below) a path representing the sun's movement from sunrise, to solar noon, to sunset.



- At solar noon in the southern hemisphere, you have to face towards the \_\_\_\_\_ to see the sun, and your shadow will be pointing towards the \_\_\_\_\_. (As mentioned, this doesn't necessarily apply in the tropics.)

- am (eg. 7am) stands for \_\_\_\_\_ which means \_\_\_\_\_.

- pm (eg 5pm) stands for \_\_\_\_\_ which means \_\_\_\_\_.

- The sun always gets to its highest elevation at solar noon. What is meant by the word elevation? \_\_\_\_\_

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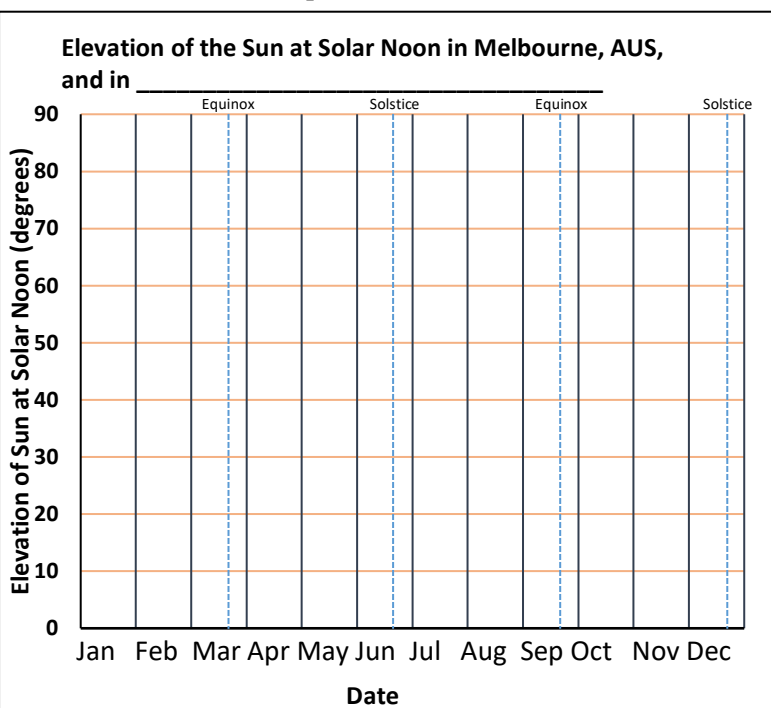


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9. Go to the Time and Date website ([www.timeanddate.com](http://www.timeanddate.com)), go to the *Sun and Moon* drop-down menu item and then click *Sun Calculator*. Search for your city or town and find the *Solar Noon* column. Use the information to fill in the table on the left. Draw up a line graph for the sun's elevation in Melbourne and in the city of your choice for Solar Noon throughout the year. (There will be two lines on the graph.) Each solid vertical line represents the **start** of the month.

Elevation of Sun at Solar Noon Throughout the Year		
Date	Melbourne, AUSTRALIA Latitude: 38°S	_____, _____ Latitude:
Jan 1	75°	
Feb 1	69°	
Mar 1	60°	
March 21 (Equinox)	52°	
April 1	48°	
May 1	37°	
Jun 1	30.2°	
June 21 (Solstice)	28.8°	
Jul 1	29.1°	
Aug 1	34°	
Sep 1	44°	
September 23 (Equinox)	52°	
Oct 1	55°	
Nov 1	67°	
Dec 1	74°	
December 21 (Solstice)	75.6°	

Note: the dates on which the solstices and the equinoxes occur vary slightly year to year.



10. Comment on how the elevation of the sun at solar noon changes throughout the year (for your location).

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11. What is the elevation of the sun at sunrise and sunset? \_\_\_\_\_

12. The sun rises in the general direction of east, but it rises exactly east on only two days of the year:

13. Describe the way the sun's movement across the sky varies throughout the year in your hemisphere and

comment on how the highest angle that it reaches changes throughout the year.

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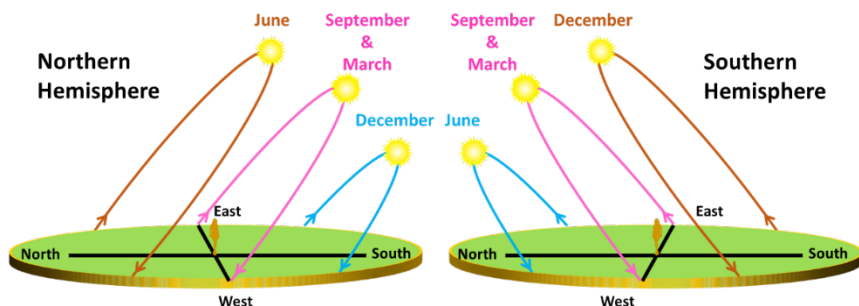
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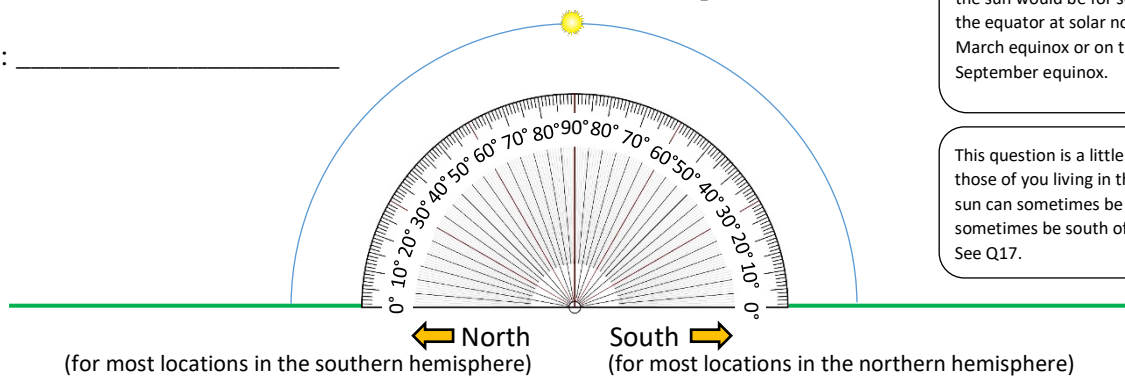
14. In the southern hemisphere, solar panels and solar hot water systems face towards the \_\_\_\_\_ to catch the midday sun while in the northern hemisphere, they face towards the \_\_\_\_\_. (Note: This doesn't apply to tropical regions; see Part D.)



15. Use the information about your location in the table on page 1 to draw the position of the sun (its elevation) at solar noon on

(a) the December Solstice (b) the June Solstice and (c) the Equinoxes

Location: \_\_\_\_\_



The sun already drawn in is at the position the sun would be for someone standing on the equator at solar noon on the day of the March equinox or on the day of the September equinox.

This question is a little bit more tricky for those of you living in the tropics (since the sun can sometimes be north of you and sometimes be south of you at solar noon). See Q17.

16. How does the changing path of the sun affect what plants a gardener might place in a garden bed?

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17. Explain, with text and by adding to the diagram, why the shadow of a person standing on the equator can sometimes point north and sometimes point south.




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