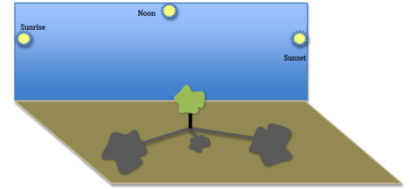


by Suzanne Shera, M.S. Author of Lightlab

LIGHTLAB EXTRA SCIENCE ACTIVITY 4: LOCAL NOON

PURPOSE: Measure a stick’s shadow in a systematic way to determine the solar noon. Compare your values with predicted solar noon. Learn to analyze and refine your measurements

BACKGROUND: Local noon occurs when the sun is highest in the sky. So, the shadow it casts on the ground will be the shorter than any other time of the day. This time is called solar noon or local noon, and it can be quite different from 12:00 noon on the clock which is "Standard" time.



There are various applications such as <https://www.timeanddate.com> that provide valuable background on this topic and help you find local noon by simply entering the date and your location. The application will provide a data table on various solar facts including the solar noon time. For example, if you live in Philadelphia PA, your first row will look like the display below where the Solar noon is 12:44pm.

2022	Sunrise/Sunset		Daylength		Astronomical Twilight		Nautical Twilight		Civil Twilight		Solar Noon	
Nov	Sunrise	Sunset	Length	Diff.	Start	End	Start	End	Start	End	Time	Mil. mi
1	7:29 am	5:58 pm	10:28:32	-2:18	5:58 am	7:29 pm	6:29 am	6:58 pm	7:01 am	6:26 pm	12:44 pm	92.260

MATERIALS: Straight stick (15 cm – 30cm) held vertical with playdough, ruler, a pencil

PROCEDURE:

- Pick a sunny day and choose a flat location outside that is away from traffic.
- Check the local noon or solar noon using <https://www.timeanddate.com> or other.
- Find a way to hold your stick straight such as playdough or glue.
- Place the mounted stick at the same location throughout the complete measurement.
- Measure the length of the shadow at equal time intervals from 11 am to 2pm.
- Record your results in Table 1 below.

RESULTS AND DISCUSSION:

Date of experiment: _____ Location: _____ Local noon: _____

TABLE 1 Record Actual length of shadow of stick every 30 min

Time	11am	11:30 am	12:00	12:30pm	1:00pm	1:30pm	2:00pm
Length of shadow							

Enter the 2 times when the shadow was shortest. T₁ _____ and T₂ _____. Which is closest to the local solar noon? _____. Discuss here briefly : _____

To refine it, measure the stick’s shadow more frequently around the time expected for local noon. Repeat this experiment on another sunny day. Make sure to check your local noon again.

Genesis 1:14 And God said, “Let there be lights in the vault of the sky to separate the day from the night, and let them serve as signs to mark sacred times and days and years.

by Suzanne Shera, M.S. Author of Lightlab

Date of experiment: _____ Location: _____ Local noon: _____

Decide the start time: _____ End time: _____ Time intervals _____
Vary your time intervals making them shorter near the expected local noon.

TABLE 2 Record Actual size of stick at the determined times

<u>Time</u>									
<u>Length of shadow</u>									

Record the 2 times when the shadows were shortest. T₃ _____ T₃ _____.

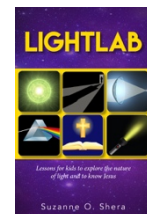
Discuss your results of Table 2. Which one is closest to the local noon? _____
Is this time closer to local noon than you obtained for T1 and T2 in Table 1?

What do you propose to do differently the next time you repeat this? Use space below to plan and record any new measurements you do.

CONCLUSION: (In a few sentences, write down what you did and what you learned)

Feel free to Contact us if you:

- want me to evaluate your work
- have questions and comments about this activity
- discover another application to tell local noon
- are ambitious and want to build your own Sundial
- have more questions on physics and the nature of light in particular.



Just email us at lightlabetc@gmail.com or contact us via the website itself: lightlabetc.com. For more postings on science and faith, follow us @lightlabetc on Instagram, Facebook, Pinterest

Genesis 1:14 And God said, "Let there be lights in the vault of the sky to separate the day from the night, and let them serve as signs to mark sacred times and days and years."