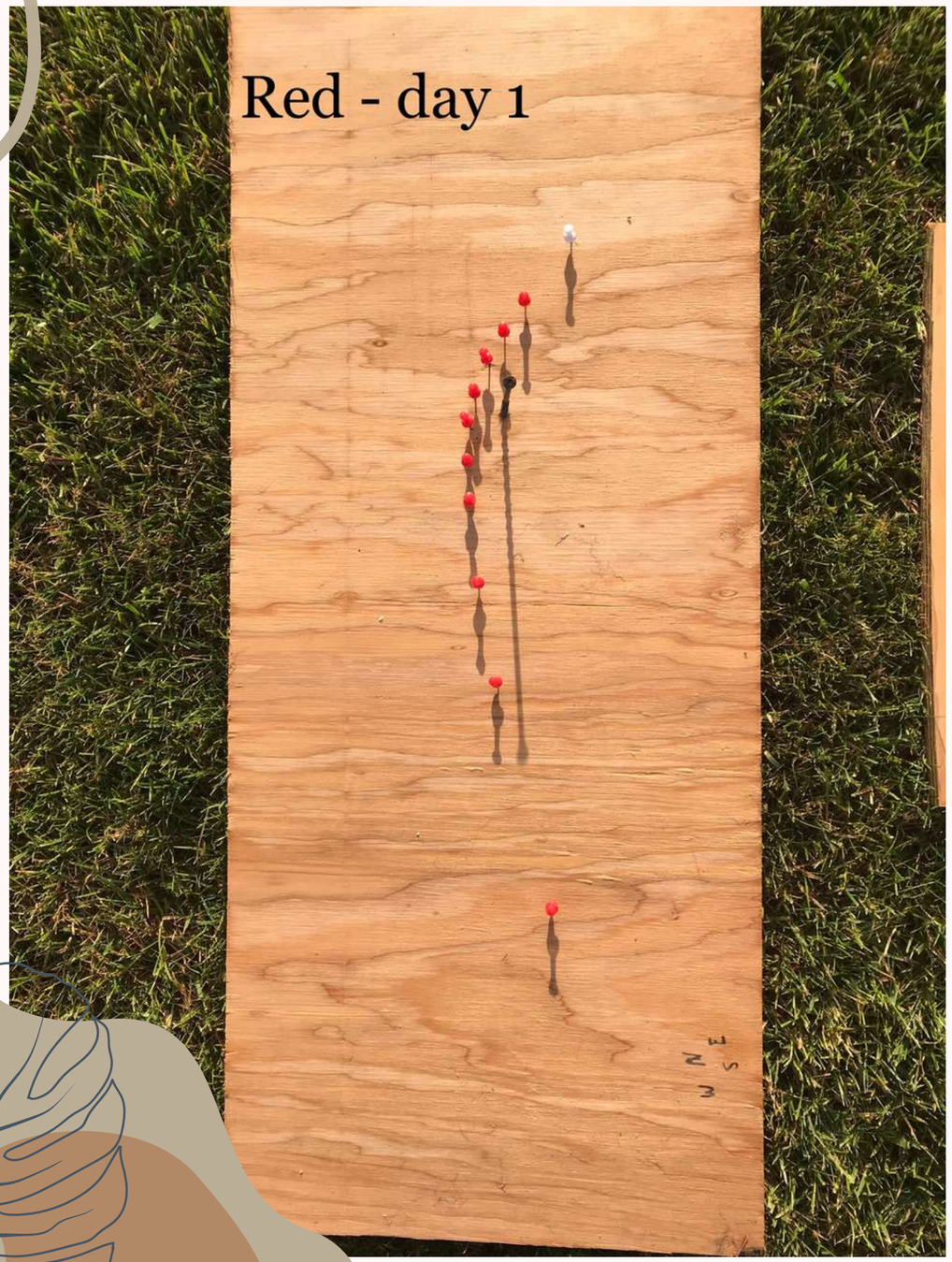
Shadow marking



Materials

What you need:

- Location free from cast shadows (from trees, buildings, etc.)
- Location free from disruption (animals, people, etc.)
- Board or something sturdy that will stay in place
- Gnomon with a pointy tip (screw is perfect)
- Pencil or pen with a fine tip to mark the shadow
- Colored push pins can be helpful to see the curve/straight line more clearly
- Data collection sheet
- Phone camera

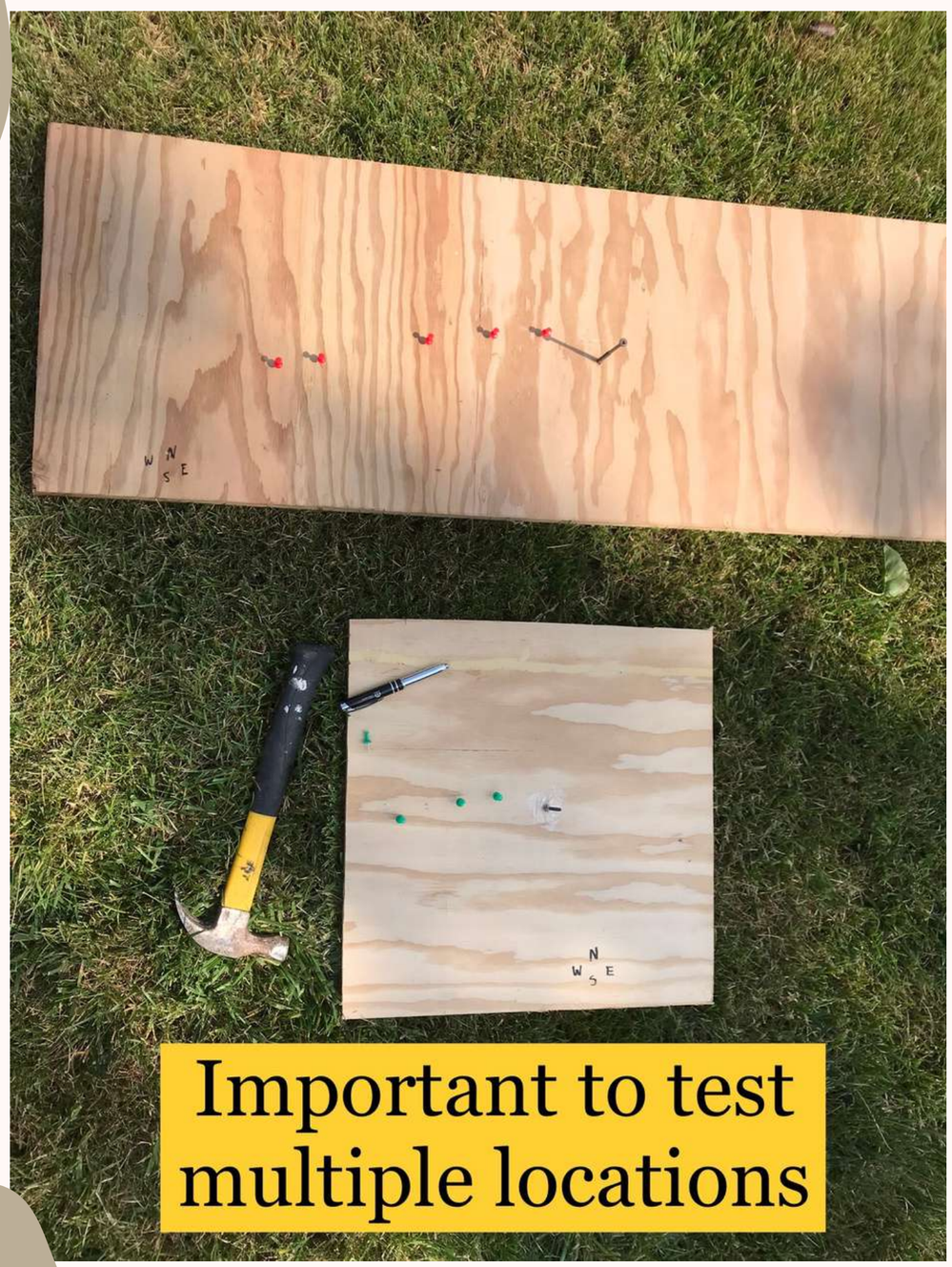
Day before

Note the following:

- When the sun is up and sunshine is covering your area
- When the sun goes down and leaves your area
- Any cast shadows from trees, buildings, etc.

This will help you find the best location for your shadow marking setup.

Survey area to plan it out



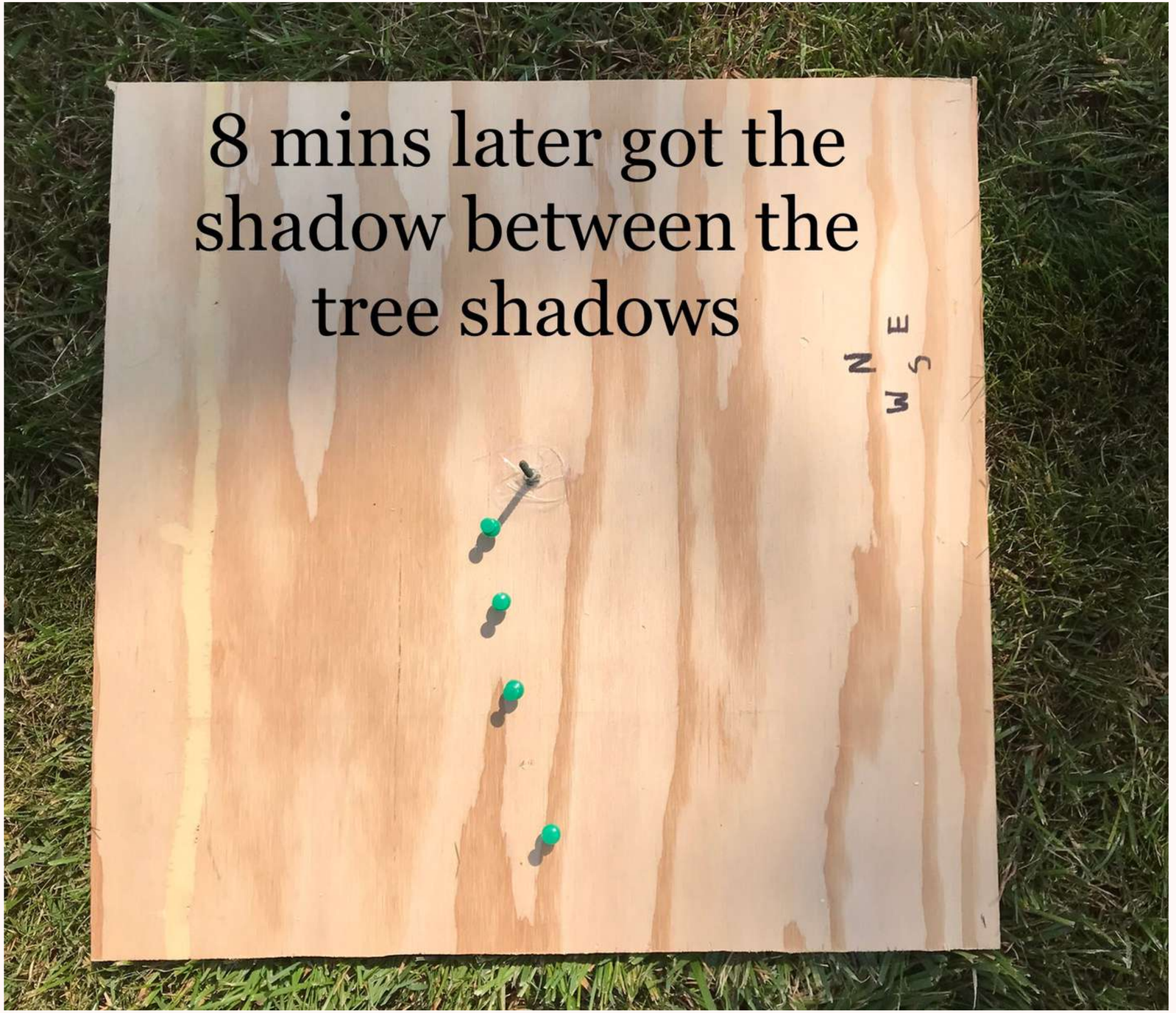
Test it out

Test the following:

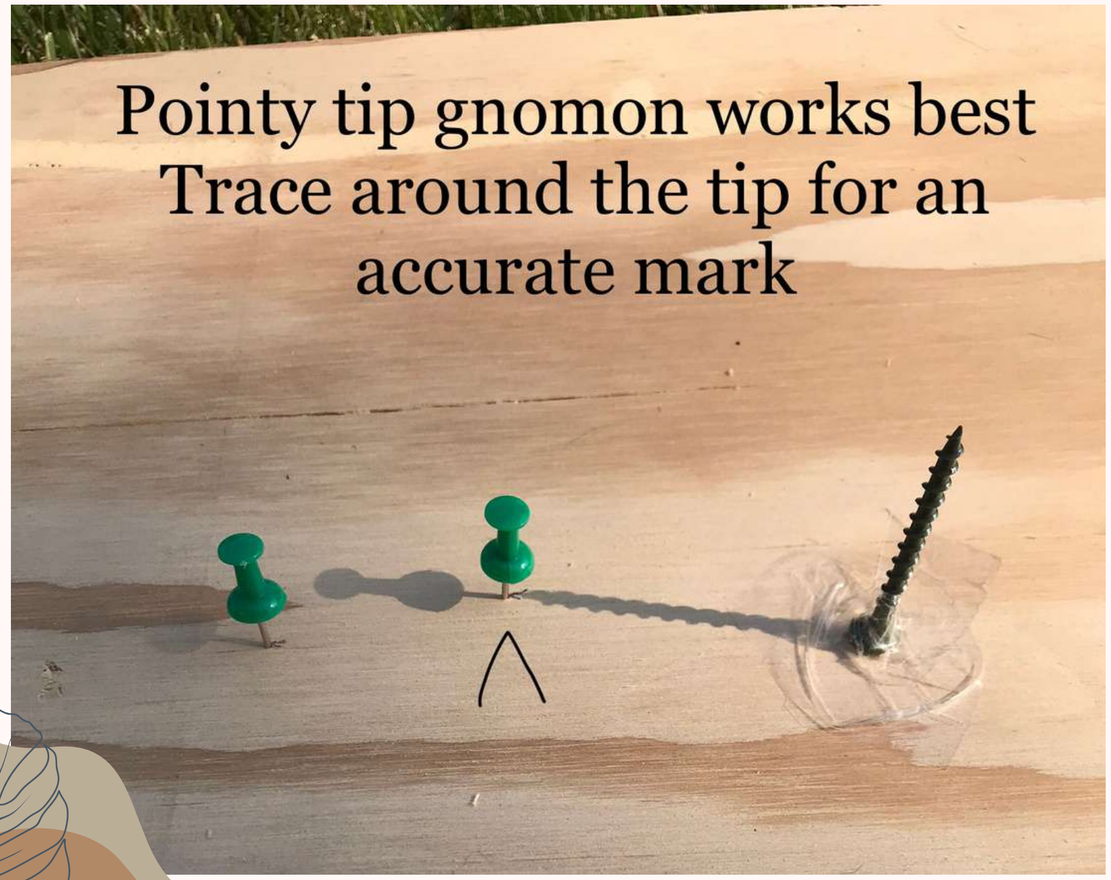
- Different locations
- Different sized boards
- Different sized gnomons

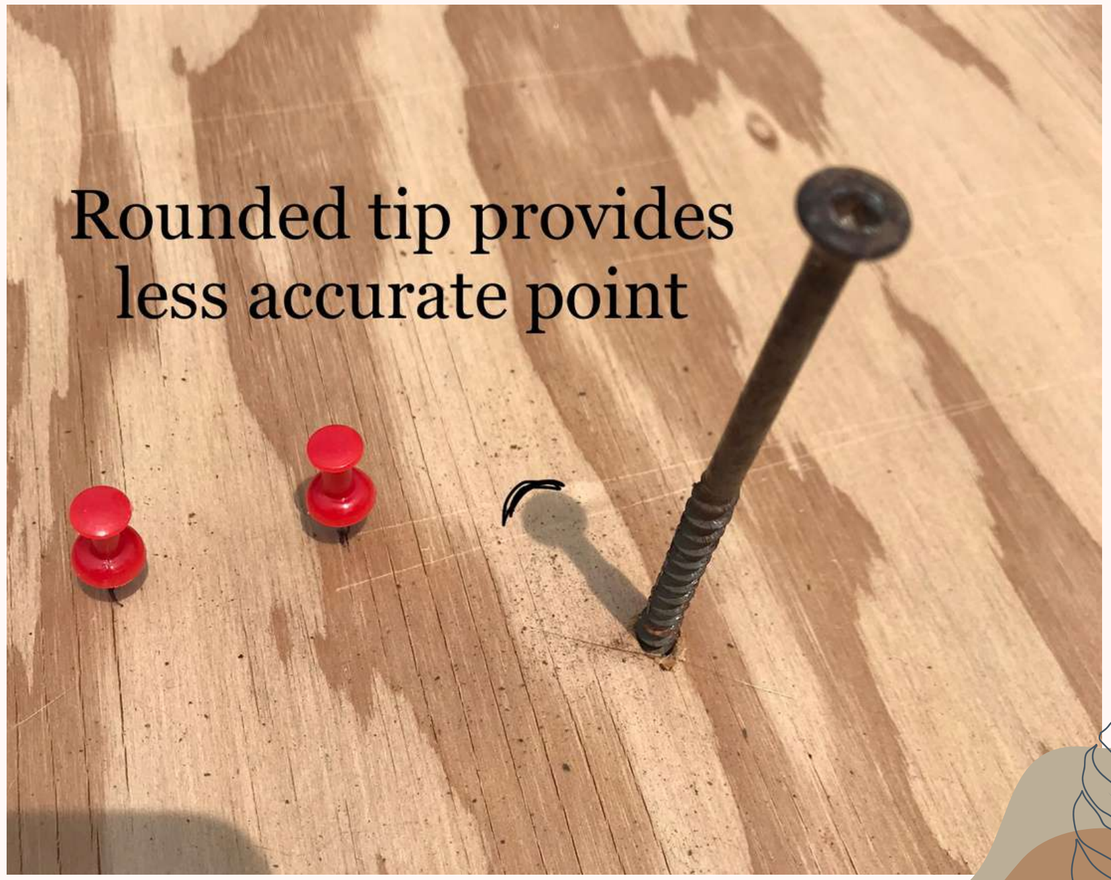
You may even want to set up a mock test run to make sure your location works and that your gnomon and board size fit well together.

Even with this setup of a few inches apart I had cast shadows on one but was able to mark the gnomon shadow on the other.

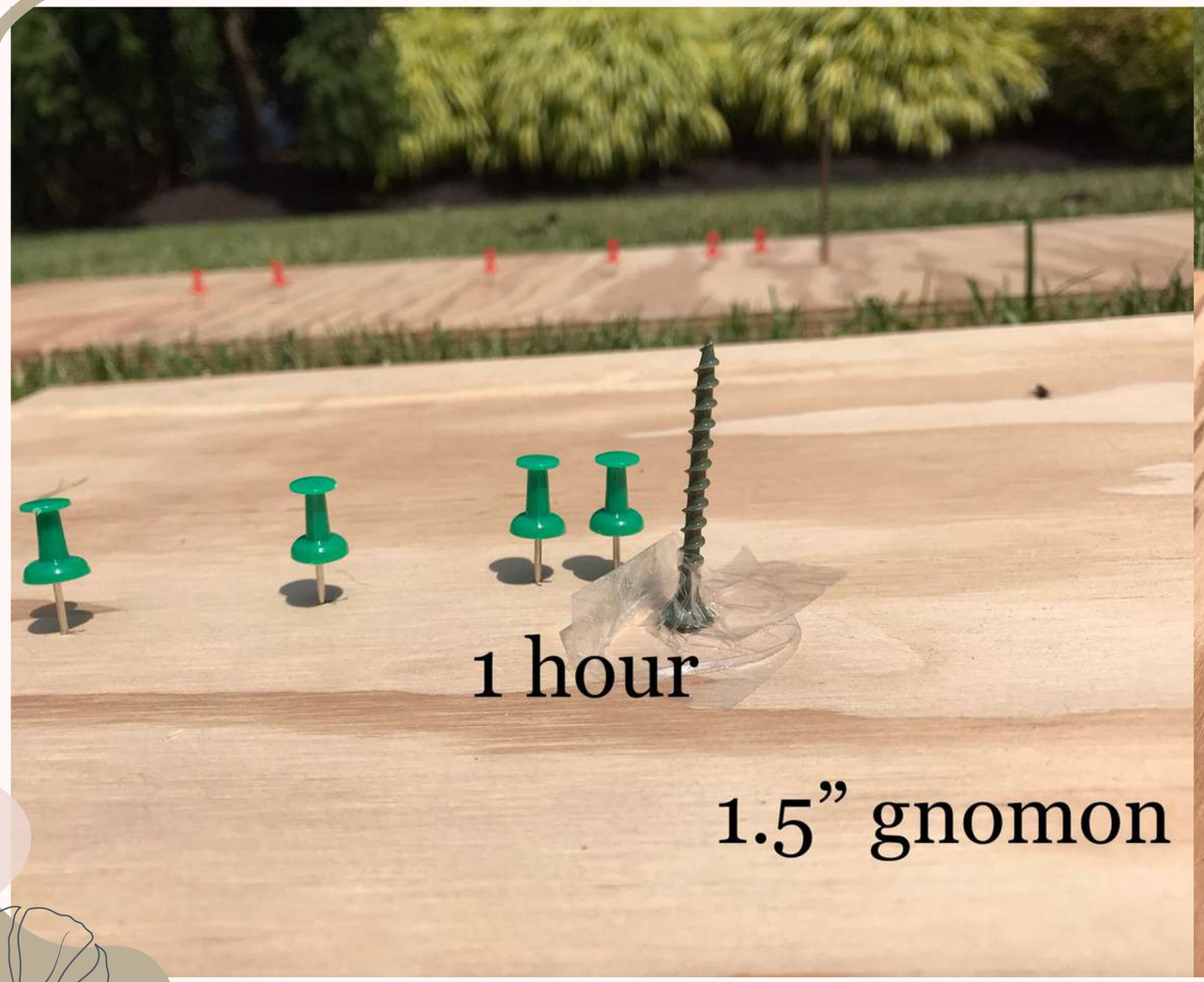

8 mins later got the shadow between the tree shadows
N
E
W
S

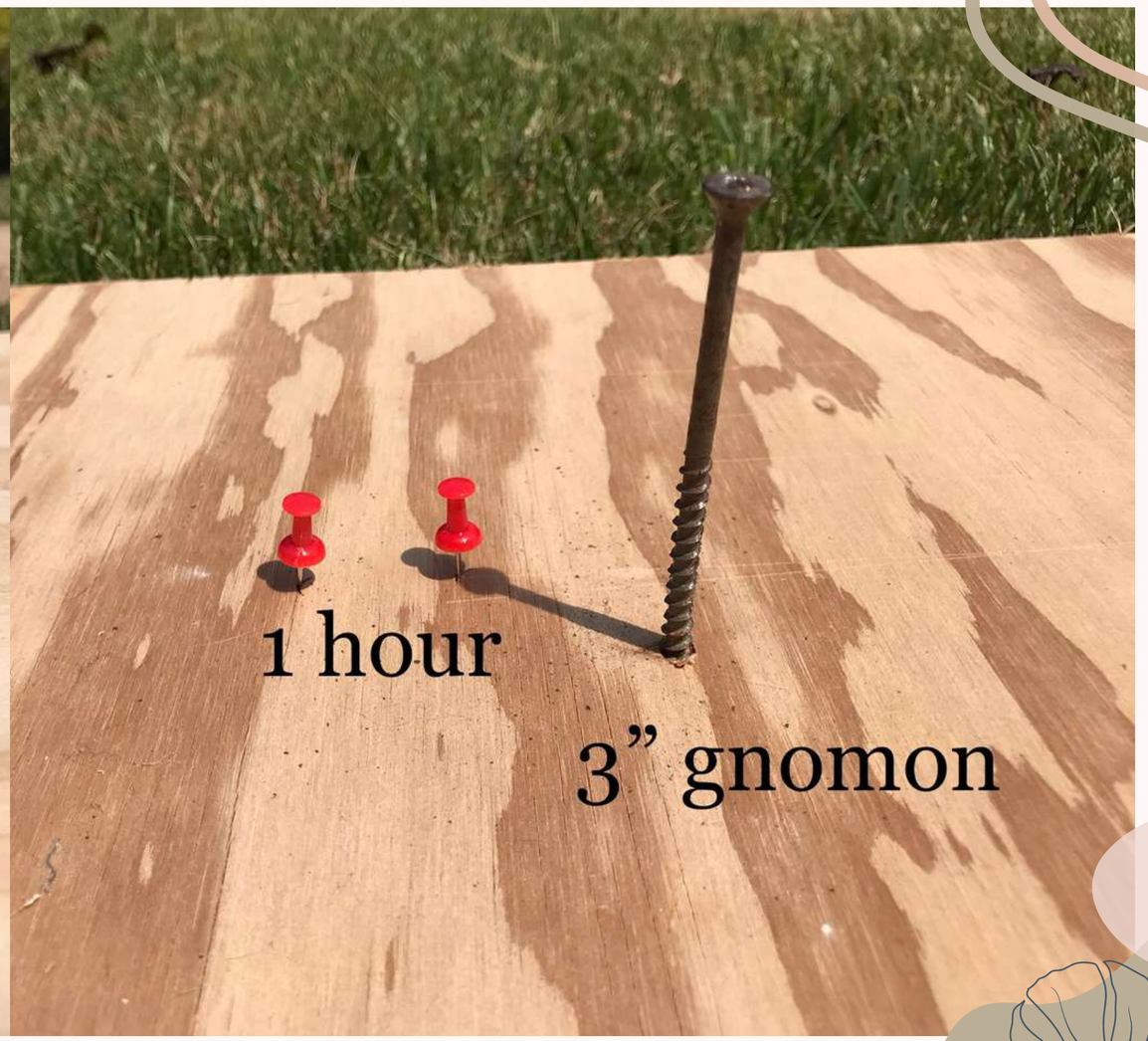
Gnomon


Pointy tip gnomon works best
Trace around the tip for an
accurate mark


Rounded tip provides
less accurate point

Gnomon

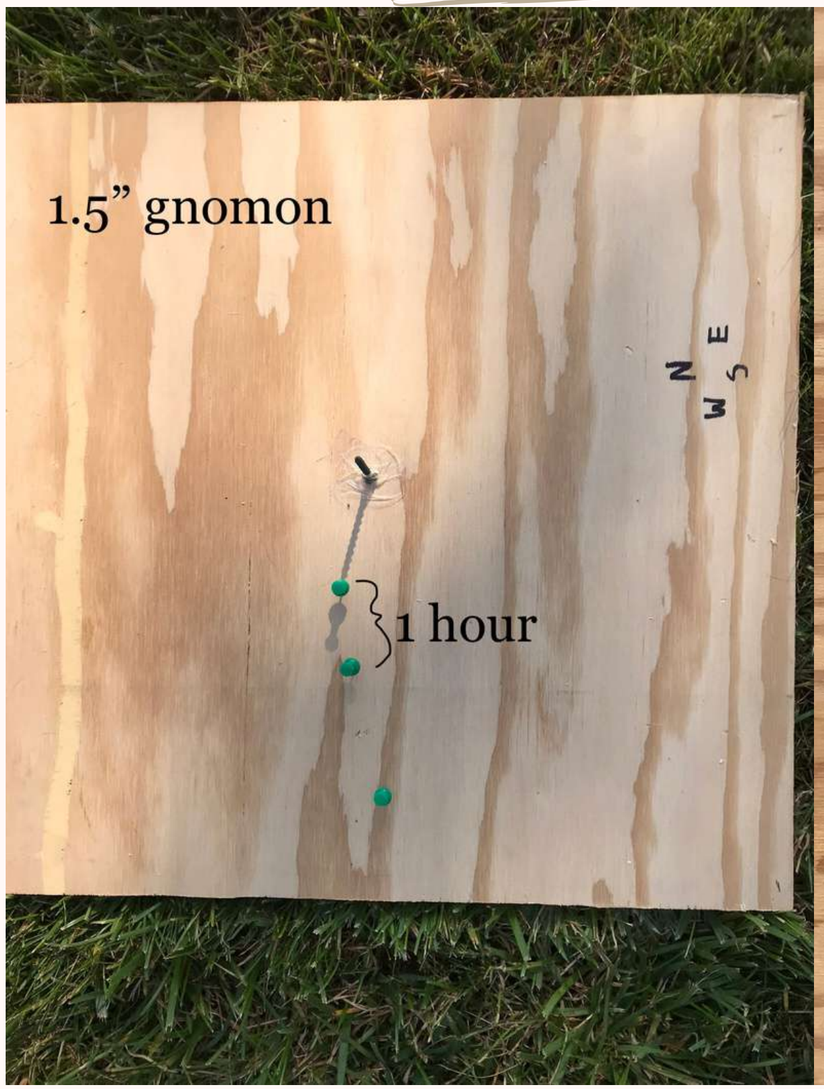


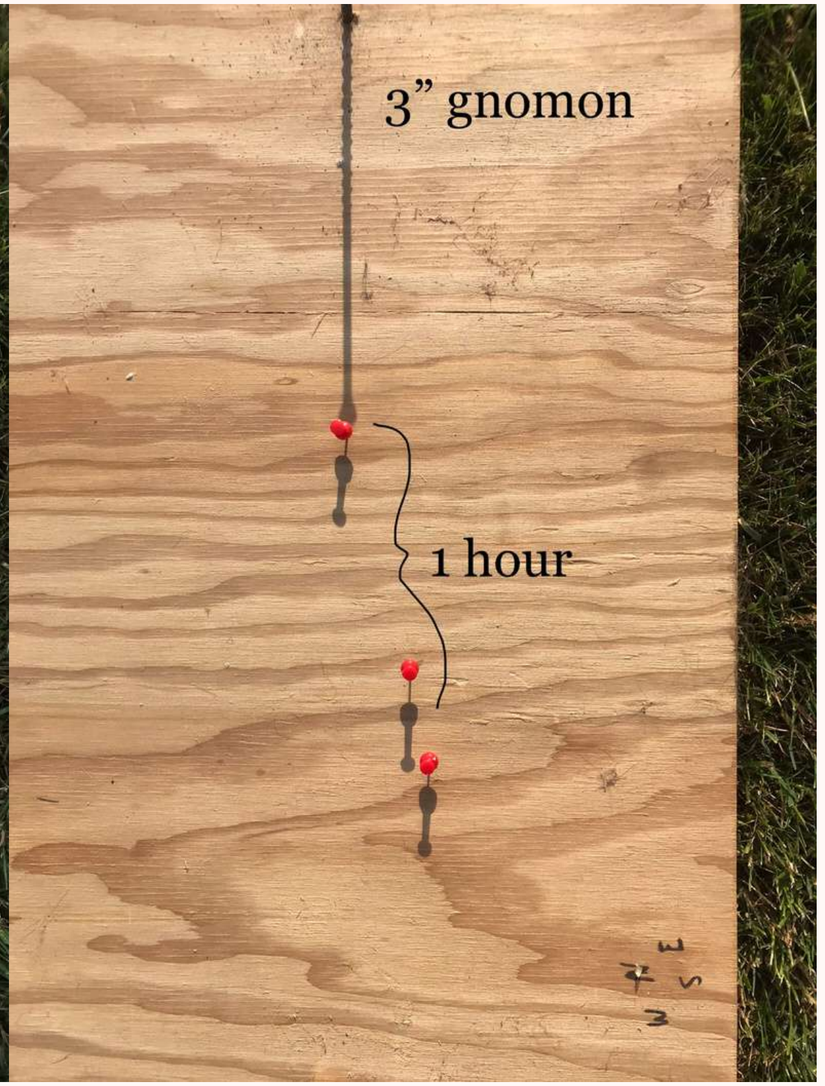


Taller gnomons will create a larger distance between markings.

Gnomon

16x16 board





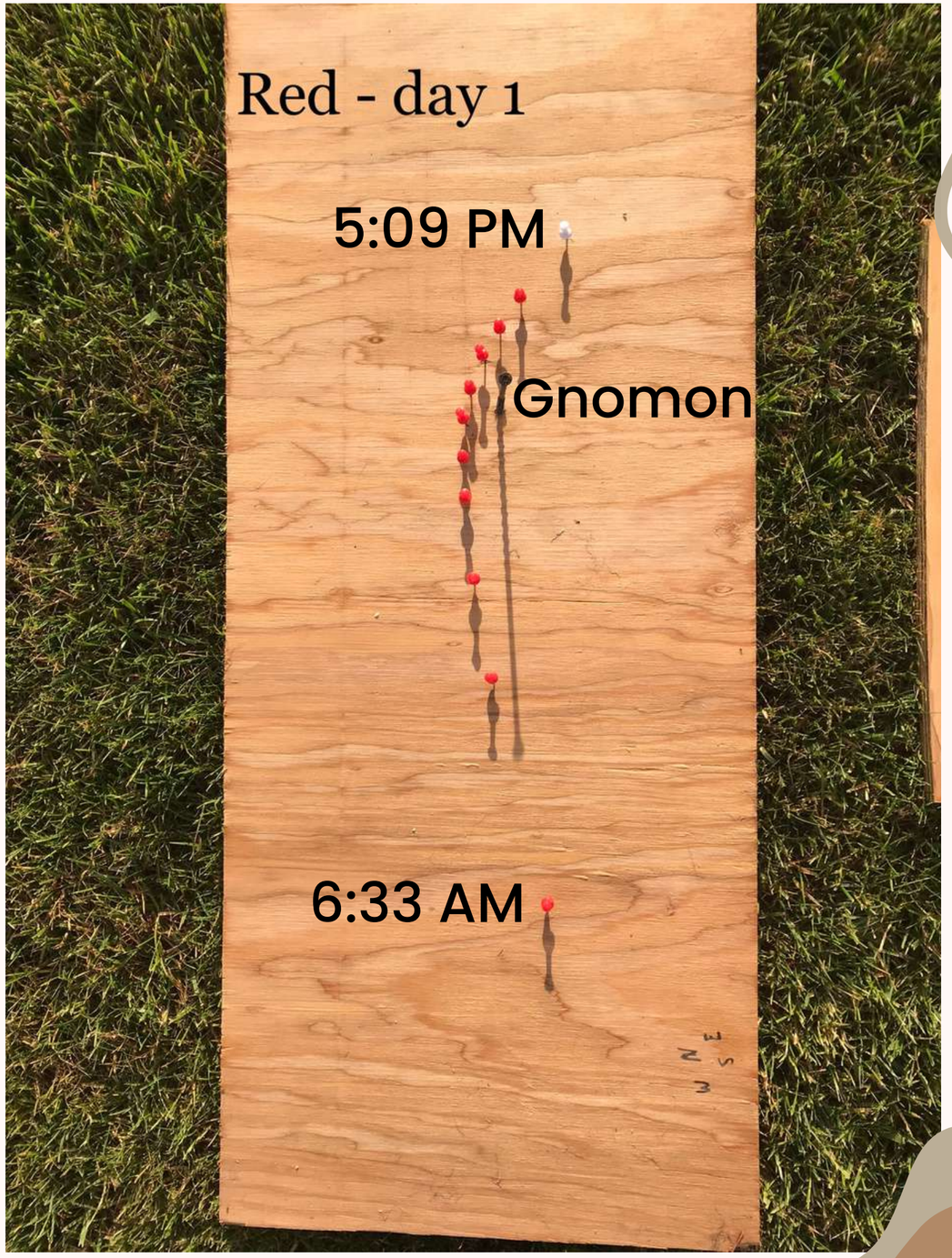
48x15.5 board

Taller gnomons also require a longer board.

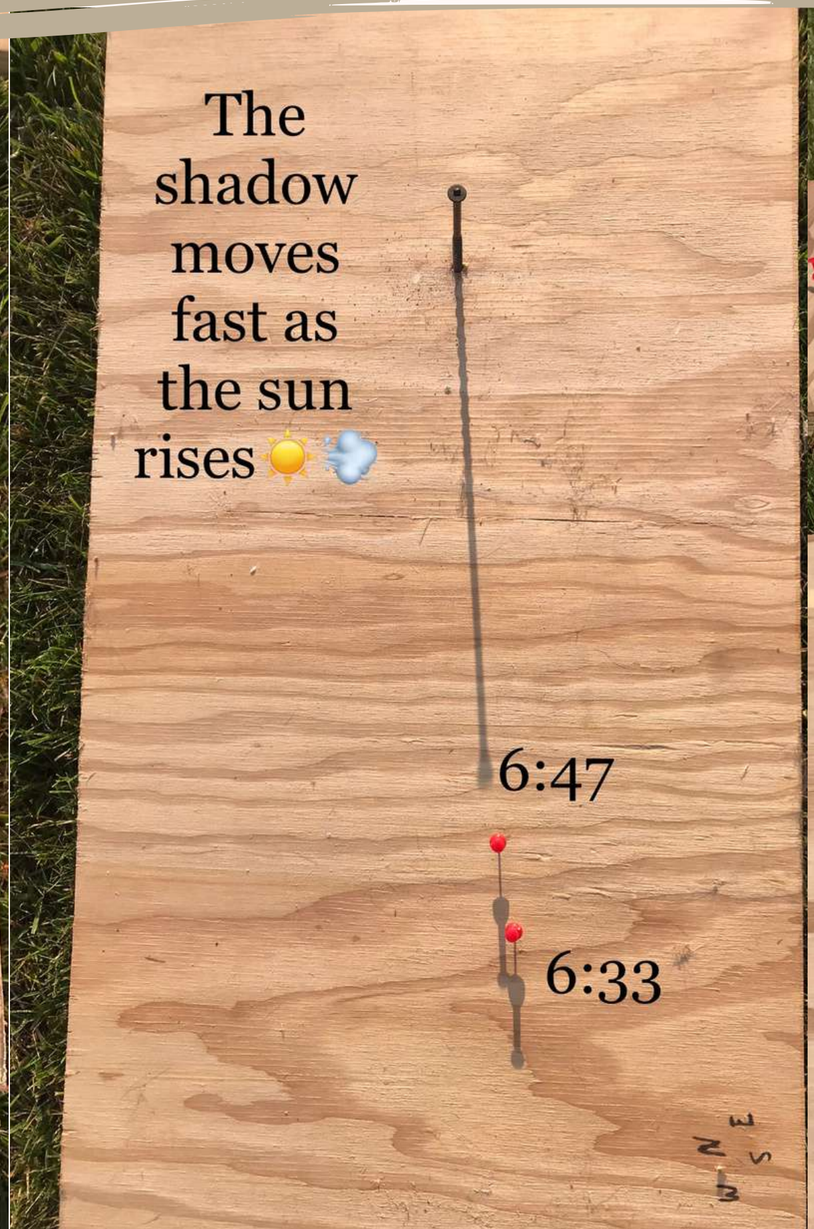
Setting up

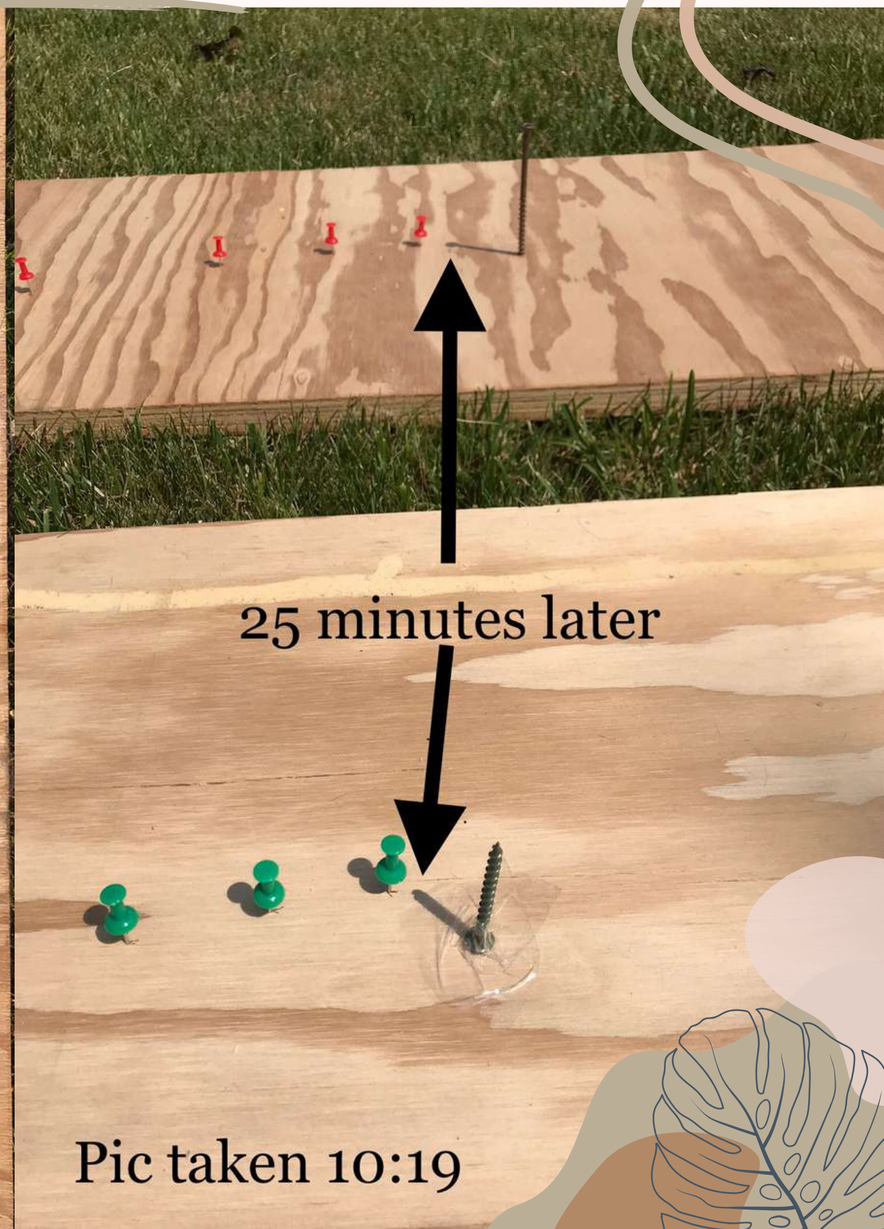
Tips:

- Try to place the gnomon at 90 degrees, perpendicular to the board
- Long boards should run East to West with the gnomon facing 0 North
- Download the compass app to figure out direction
- The shadow will be longest when the sun is rising and setting
- The shadow will be very close to the gnomon when the sun is directly above it
- Download the measure app or use a level to make sure your board is level at 0 degrees on a flat surface

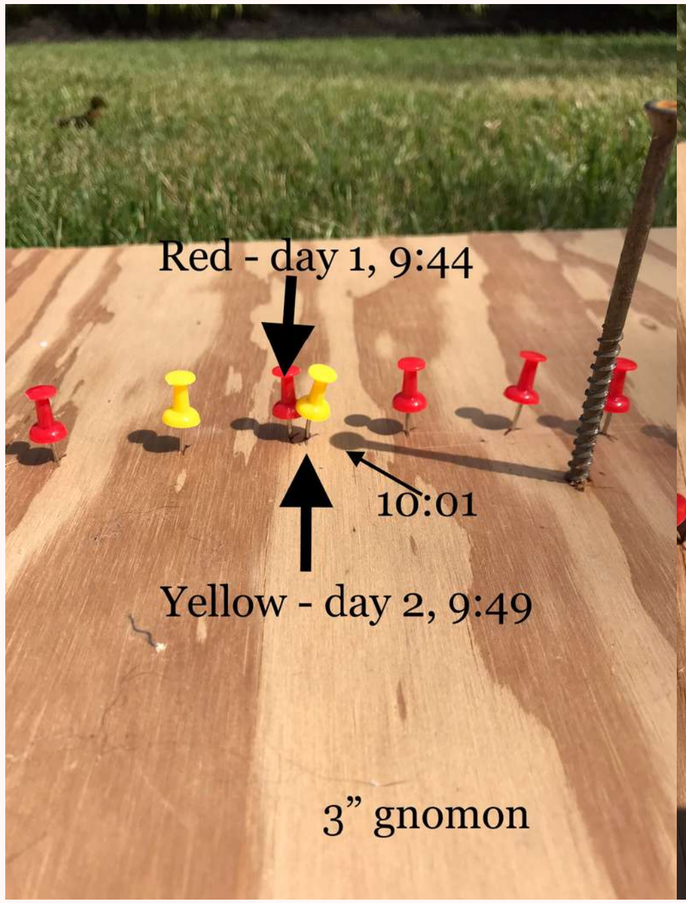


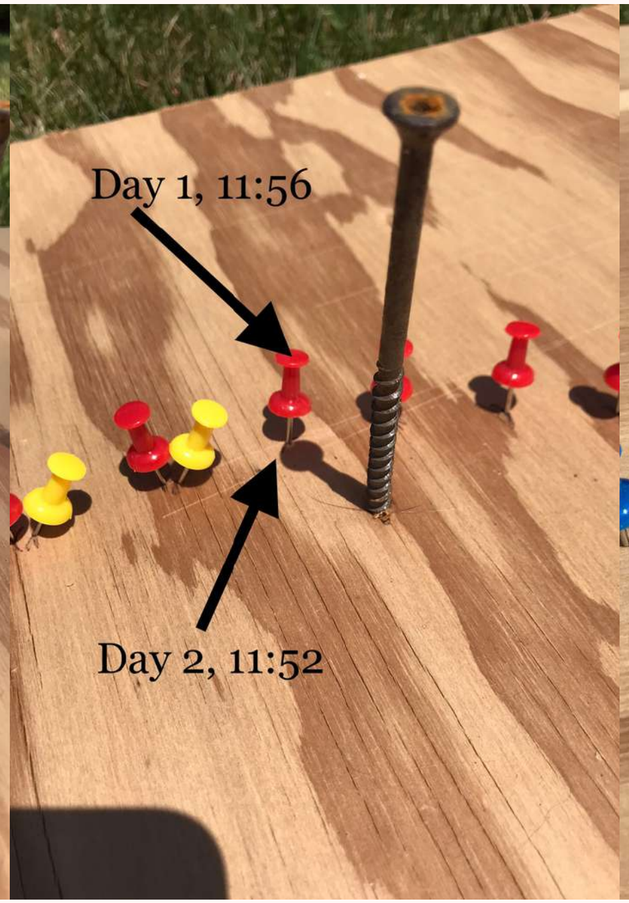
The sun moves fast!

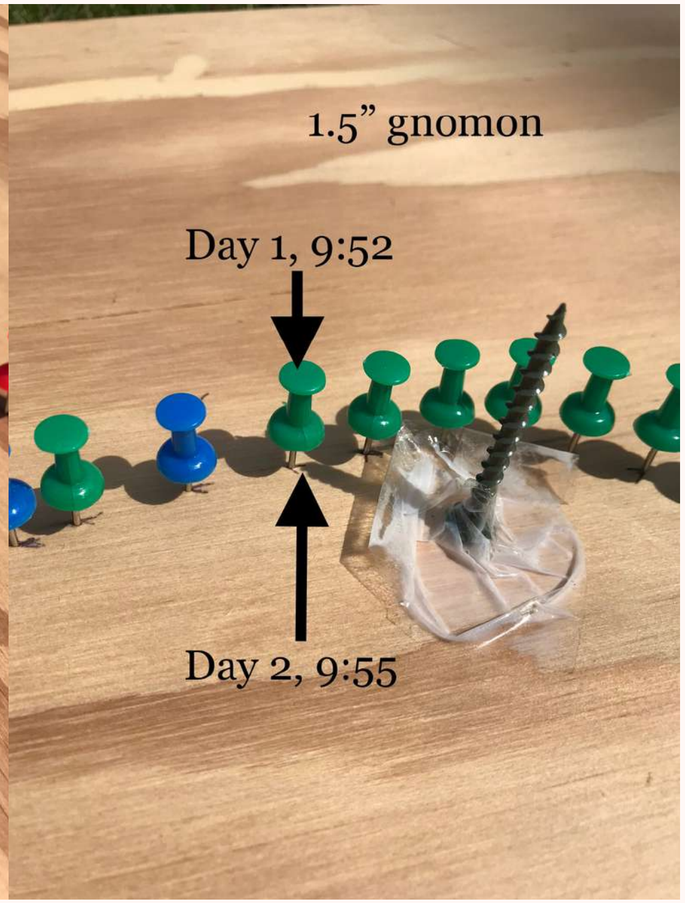




More tips





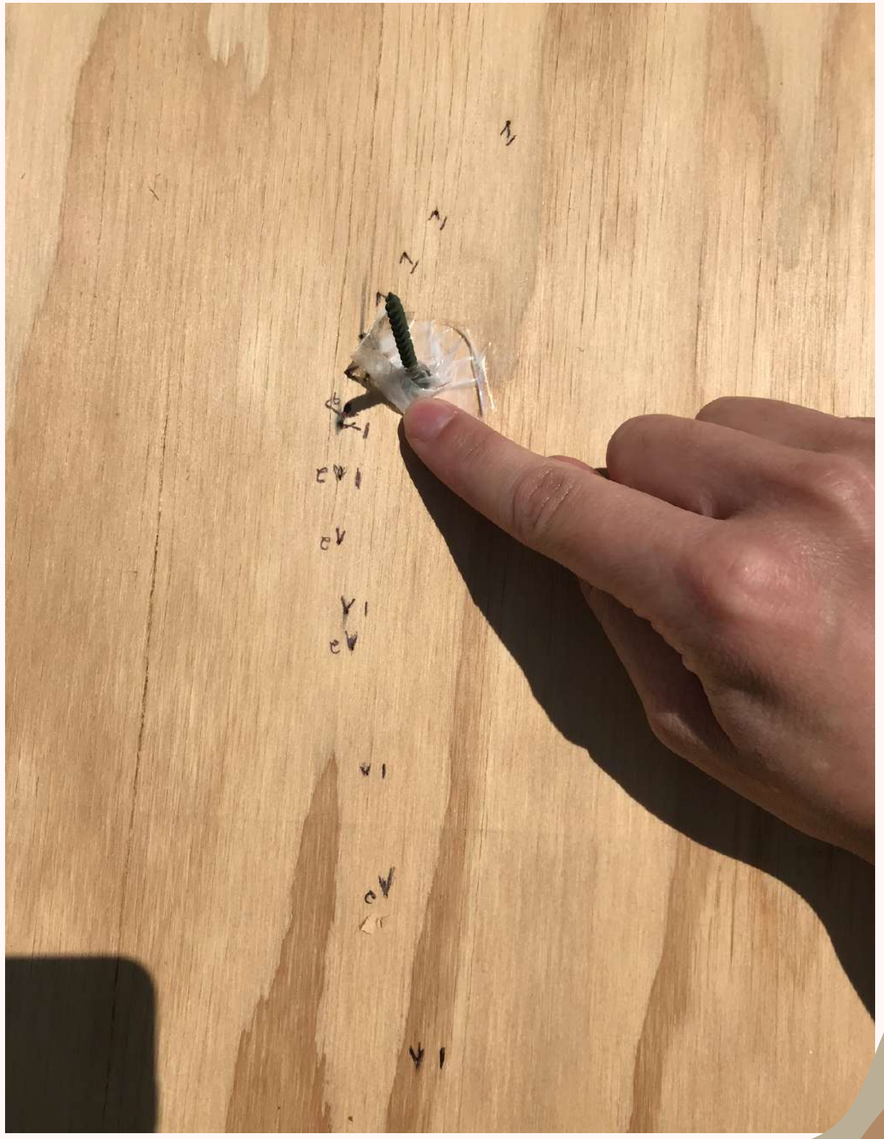


Originally I had separate color push pins for both days but it started to get crowded as the sun went closer to noon. The shadow was just about at the same mark. So for day 1 I had push pins and took a picture. Then removed those push pins. And started with new push pins for day 2.

More tips

I used tape to hold down one of the gnomons. But the tape got in the way of the shadow marking.

So next time I'll use glue or something that goes directly under the screw head and doesn't take up space on the actual board.



How to track

- Early AM marking as soon as the sun is casting a shadow
- Use a fine point pencil or pen and trace around the shadow tip
- Put a push pin in the center of the tip (optional but helps you see the curve/straight line)
- Track at least once/hour
- Track at solar noon
- Note down the times that you track
- Track for at least 10 hours

At the end of each day:

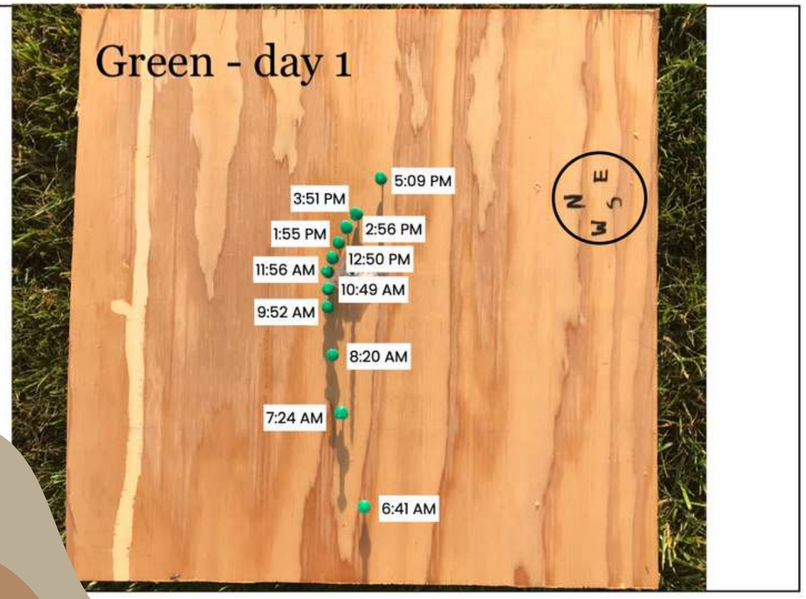
- Take a picture of your board and upload to a data collection sheet OR
- Fill out data collection on a piece of paper and put the paper on your board then take a picture of both

Data collection

- Date of marking
- Location (state, province, etc.)
- Time zone name or UTC
- Total shadow markings
- 1st marking time
- Last marking time
- Solar noon time
- Height of gnomon
- Length from 1st marking to last
- Mark North, East, West, South on picture
- Initials
- Send to team leader

Shadow marking data

Date of marking	June 20, 2023
Location	Long Island, New York, USA
Time zone name / UTC time zone	Eastern, UTC -5
Total markings	11
1st marking time	6:41 AM
Last marking time	5:09 PM
Solar noon time	12:50
Height of gnomon	1.5"
Length from 1st to last marking	9", 10.5 hours
Mark N, E, S, W on picture	In circle
Initials	JL



Resources

Text below is clickable and will open to the resource.

Data collection sheet - long picture


Shadow marking data

Date of marking		Picture
Location		
Time zone name / UTC time zone		
Total markings		
1st marking time		
Last marking time		
Solar noon time		
Height of gnomon		
Length from 1st to last marking		
Mark N, E, S, W on picture		
Initials		

Data collection sheet - wide picture


Shadow marking data

Date of marking	
Location	
Time zone name / UTC time zone	
Total markings	
1st marking time	
Last marking time	
Solar noon time	
Height of gnomon	
Length from 1st to last marking	
Mark N, E, S, W on picture	
Initials	

Picture

UTC and time zone names

Solar noon calculator