

# Space

Learning Objective:

To design, make and evaluate a sundial.

What does a  
sundial  
look like?

Do you know the  
answers to any of  
these questions?

What is a  
sundial  
used for?

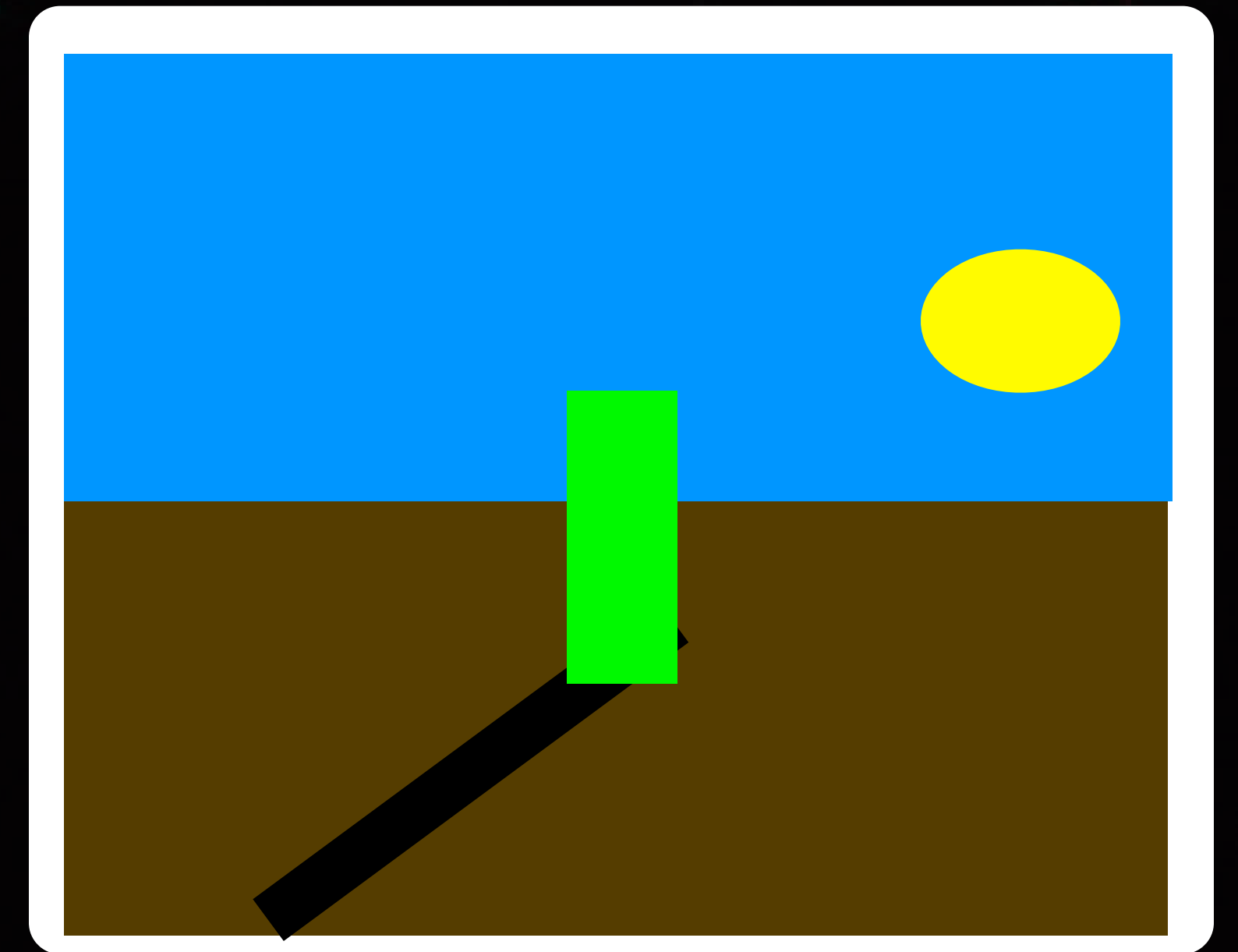
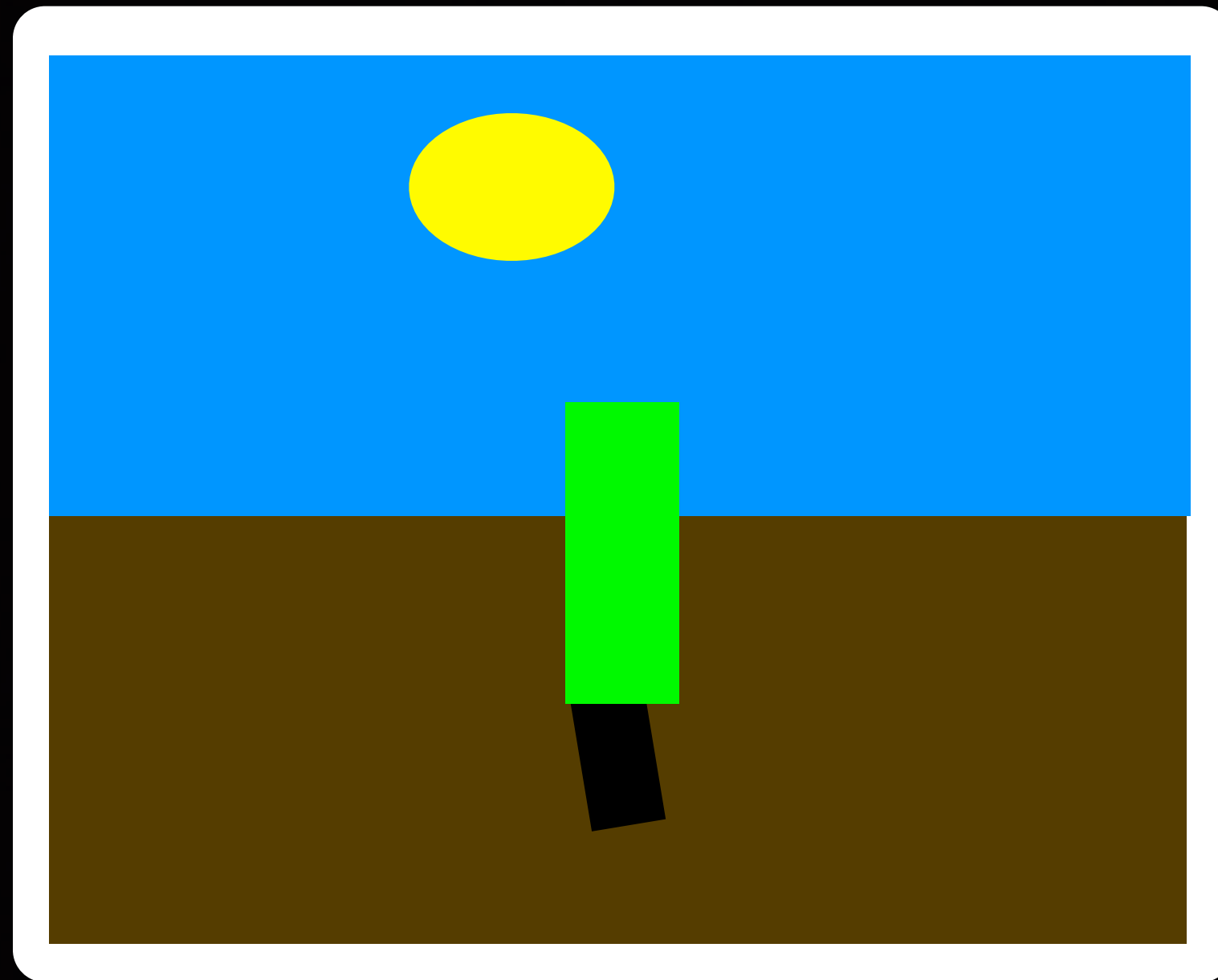
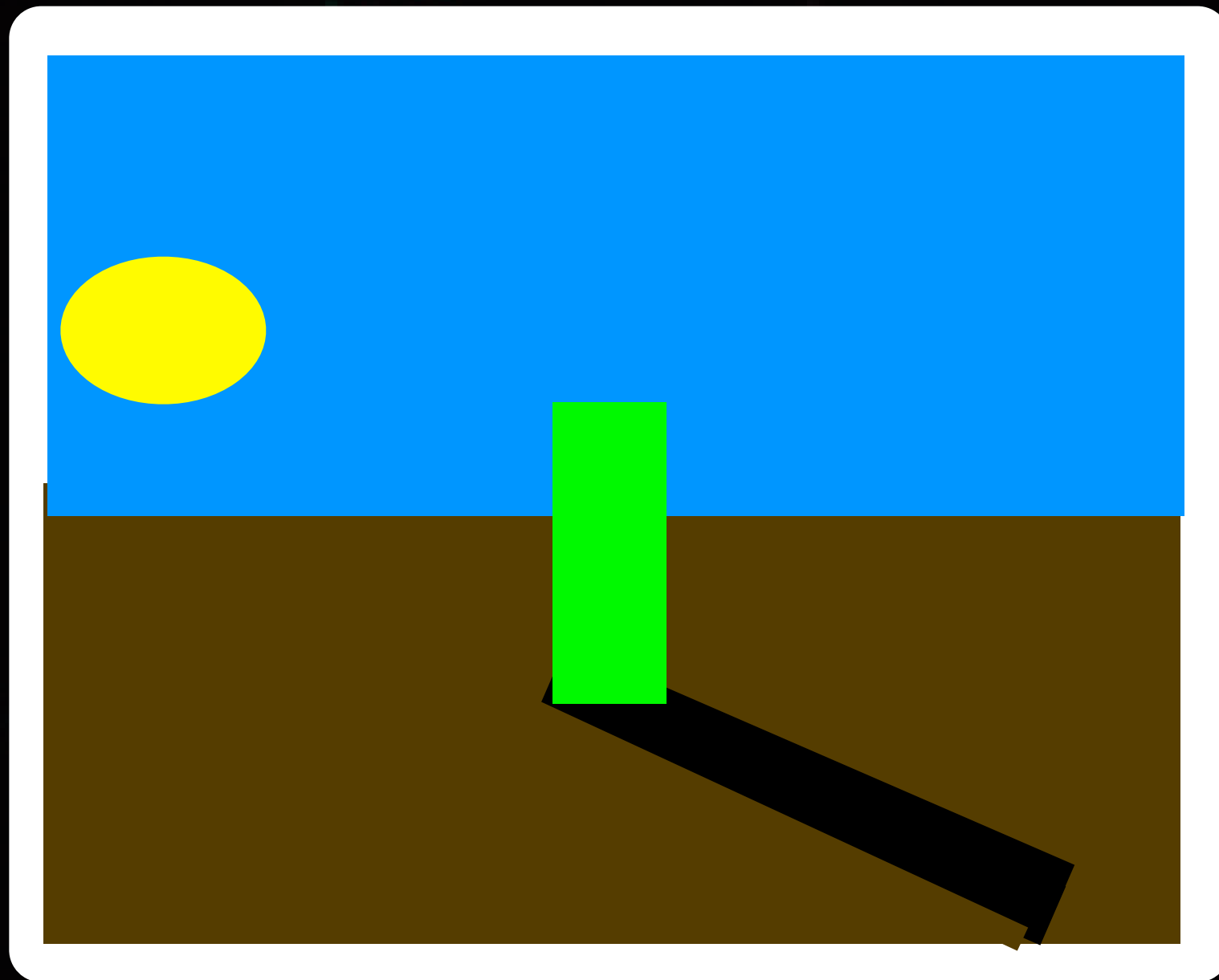
What are  
sundials  
made from?



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Sundials are instruments that use shadows from the sun's light to tell the time. As the earth rotates on its axis the sun appears to move across the sky, rising in the east in the morning and setting in the west in the evening. During the day the sun casts different shadows depending on where it is in the sky.



The earliest sundials were simply sticks in the ground whose shadows told people what the time was.

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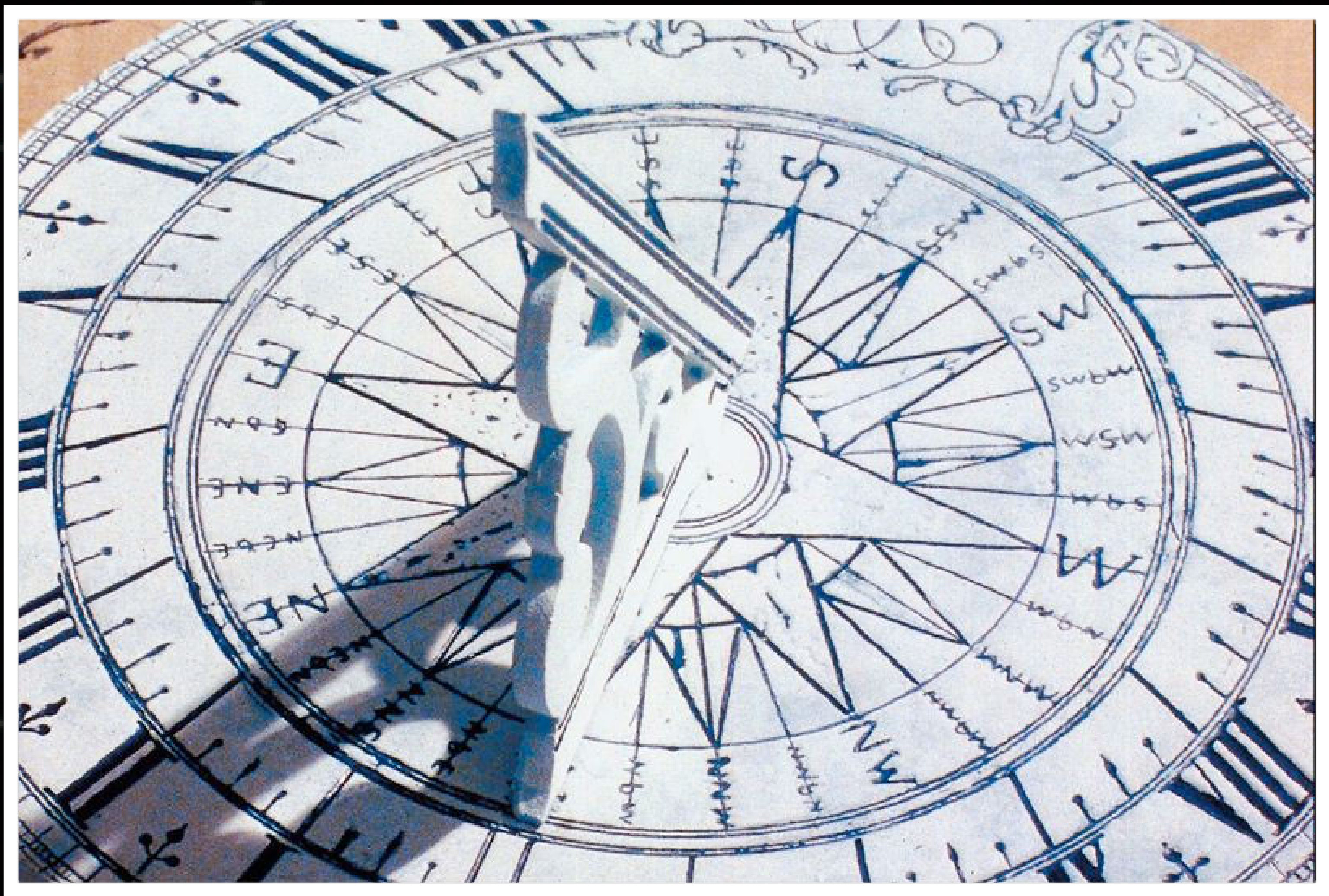
Sundials were used before people had clocks and watches to tell them what the time was. The earliest sundials go back to around 3500BC and the ancient Egyptians who used obelisks to cast shadows to separate morning and afternoon. The ancient Greeks and Romans then developed sundials to be more precise using their knowledge of geometry and mathematics.



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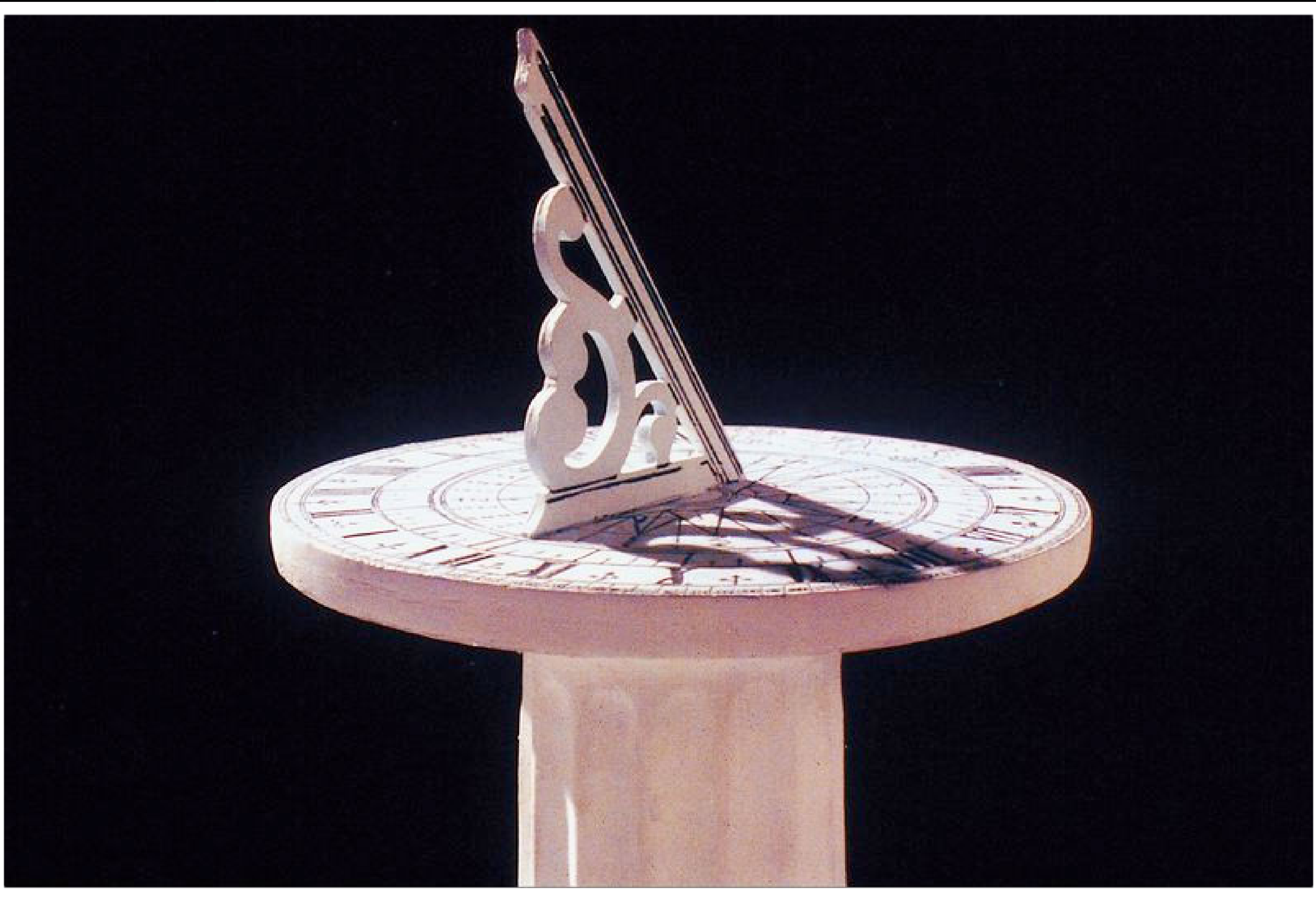


It was around 1500AD that sundials as we know them today became really popular. Have a look at these examples. Do you think you can explain how a sundial works?



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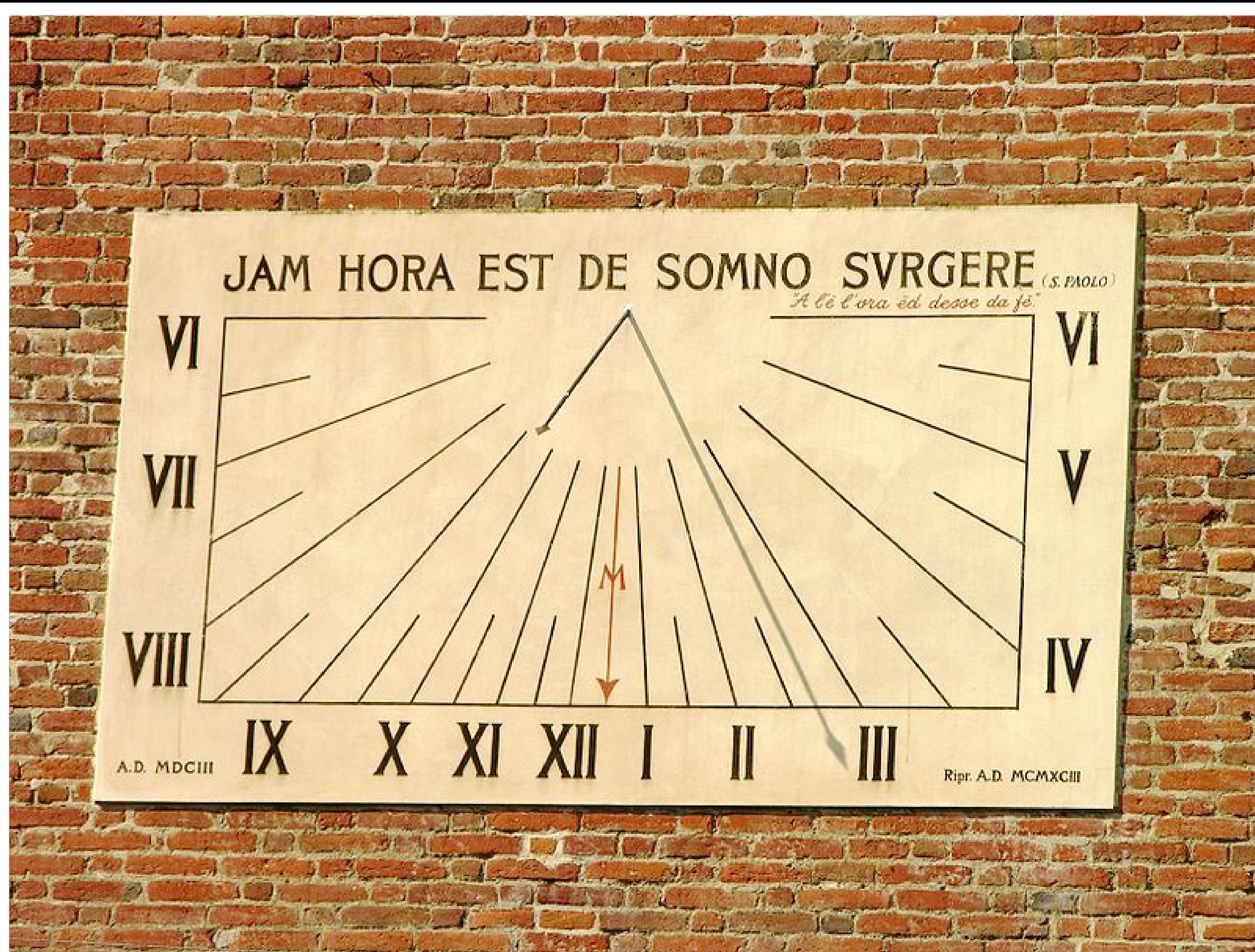


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When there is no shadow it means it is midday and the sun is directly above

The pointer that creates the shadow is called a gnomon

The numbers represent the hours

This line of the shadow is used as the measure for the hour

Why do you think the numbers don't go all the way round?

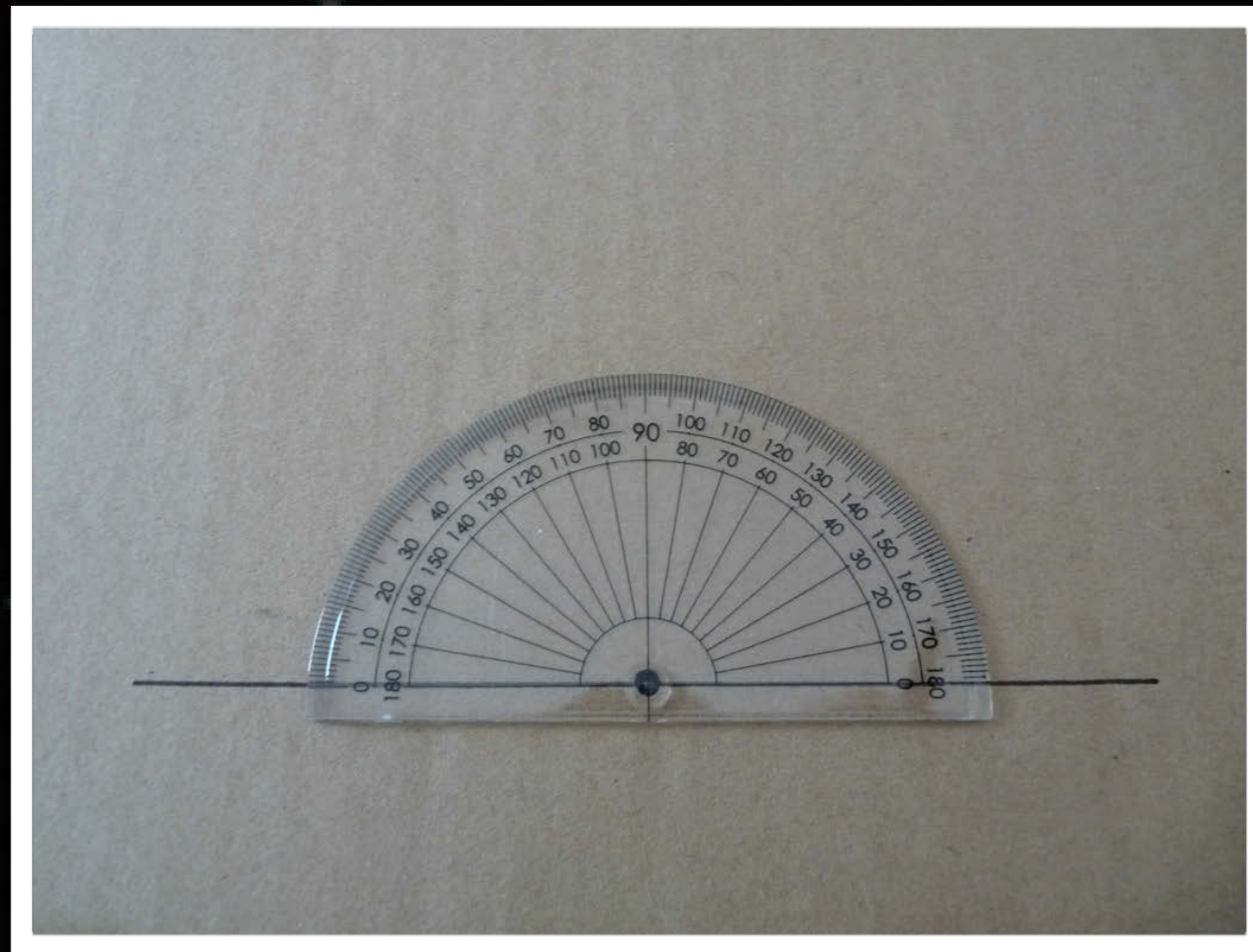
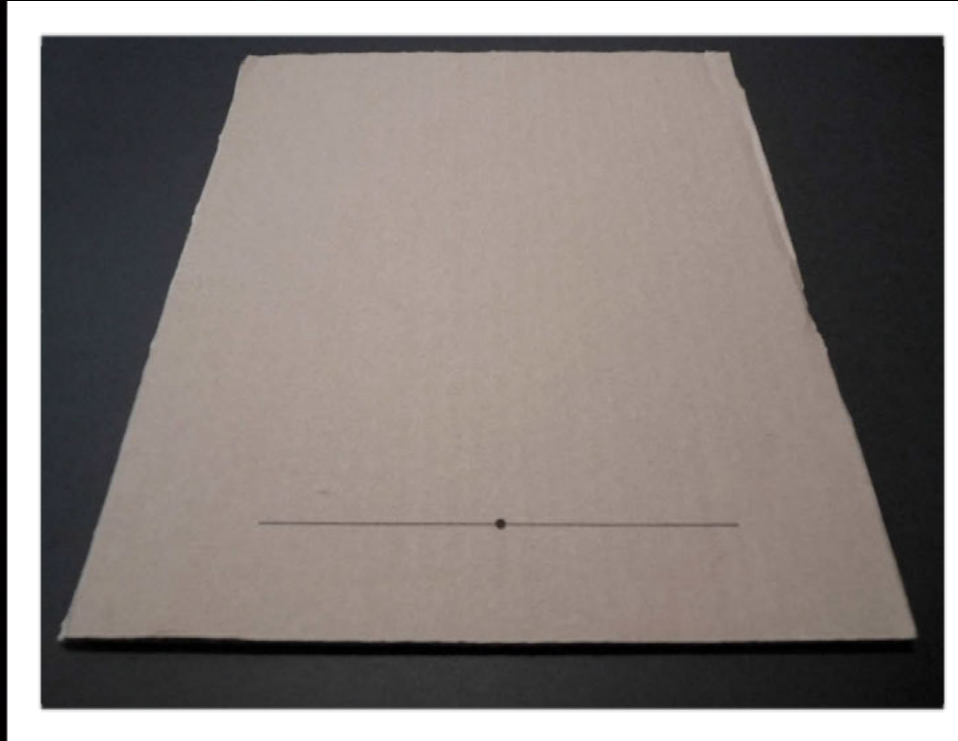
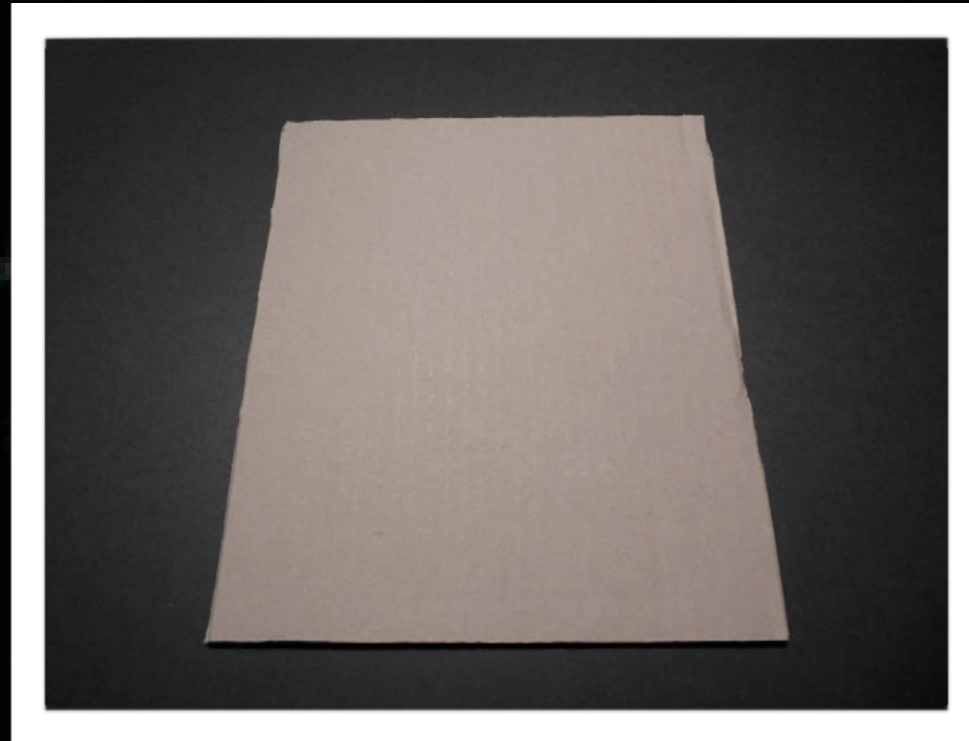
The four dots for each represent o'clock, quarter past, half past and quarter to the hour



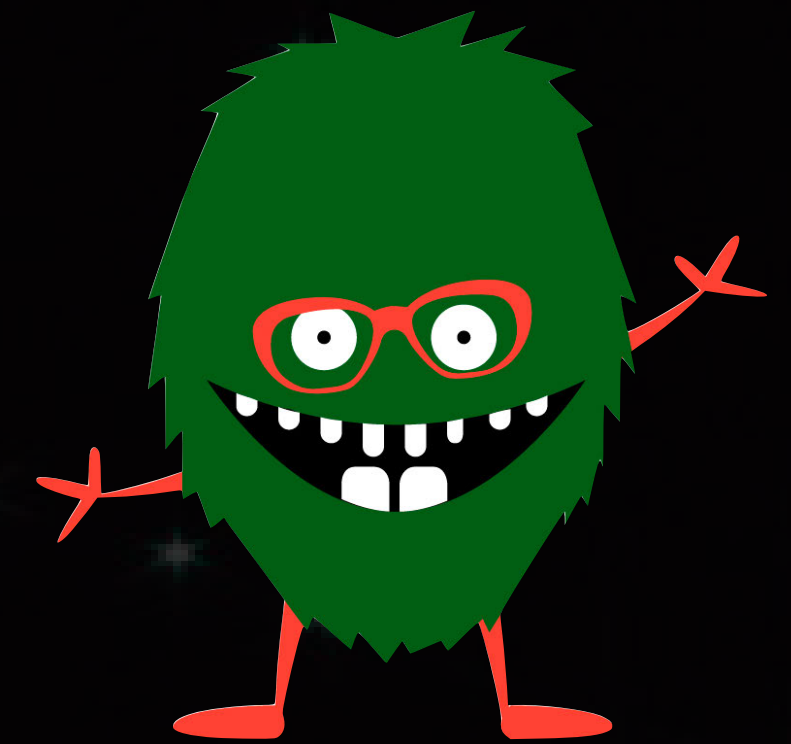
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## How to make a simple sundial



Cut a piece of card to the size you would like and draw a line across the bottom. mark the middle of the line with a dot. Try to be as accurate as you can.

Place your protractor onto the line so that the cross on the protractor runs through the centre of the dot you have drawn.

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Mark a small dot every 15 degrees on the protractor.



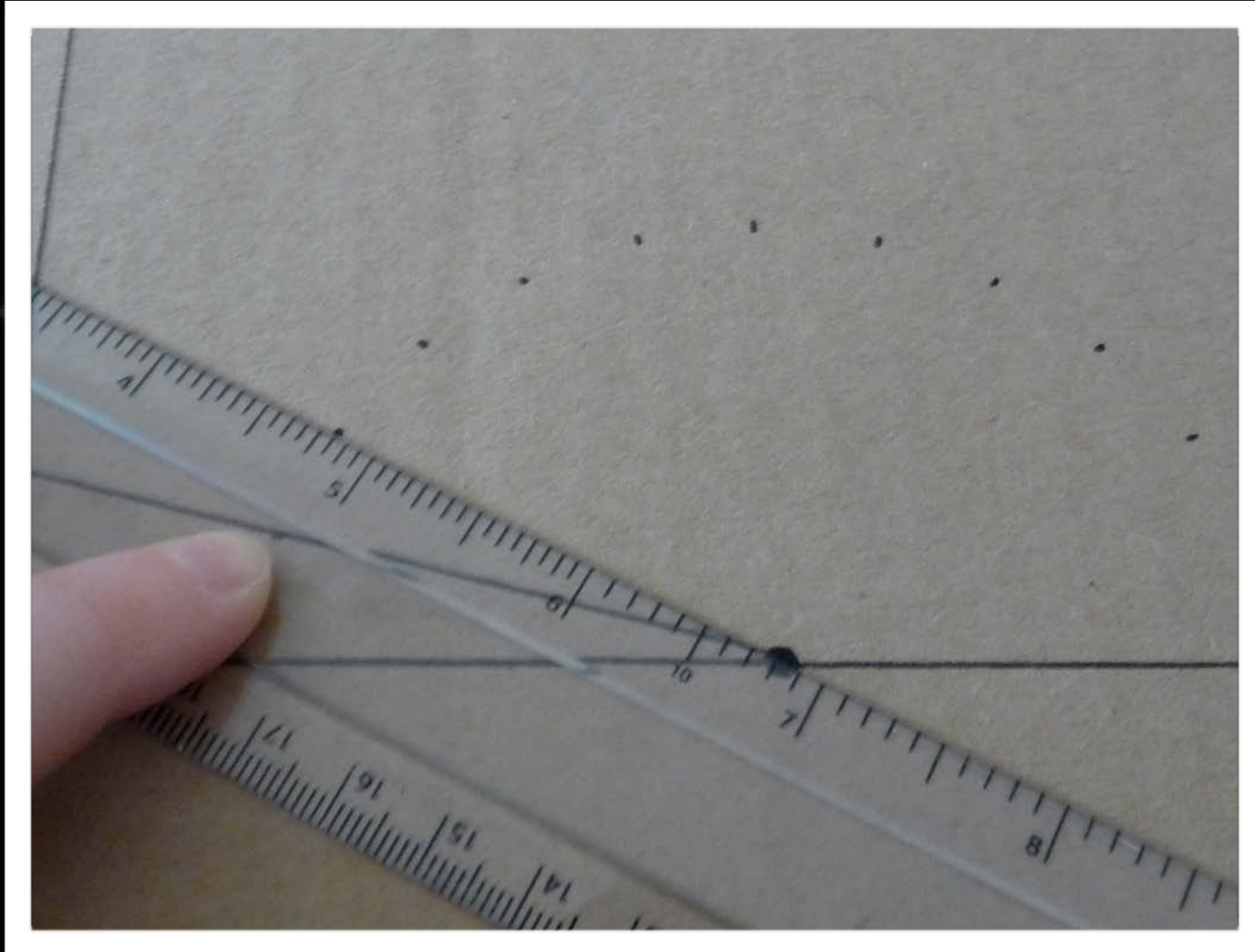
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Mark out where you would like the lines for each hour to run to.

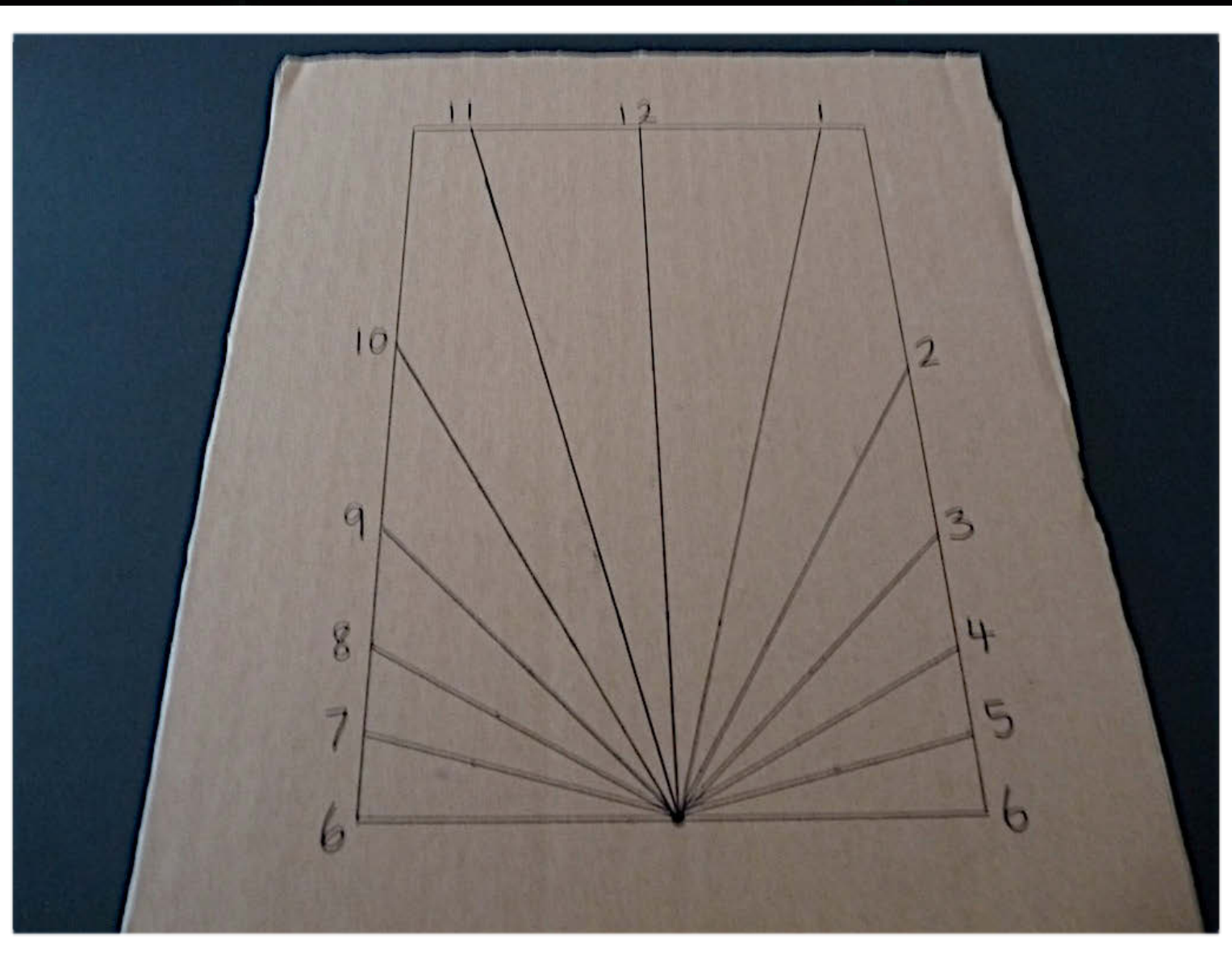


Draw a line from the centre dot through each of the marks you have made.

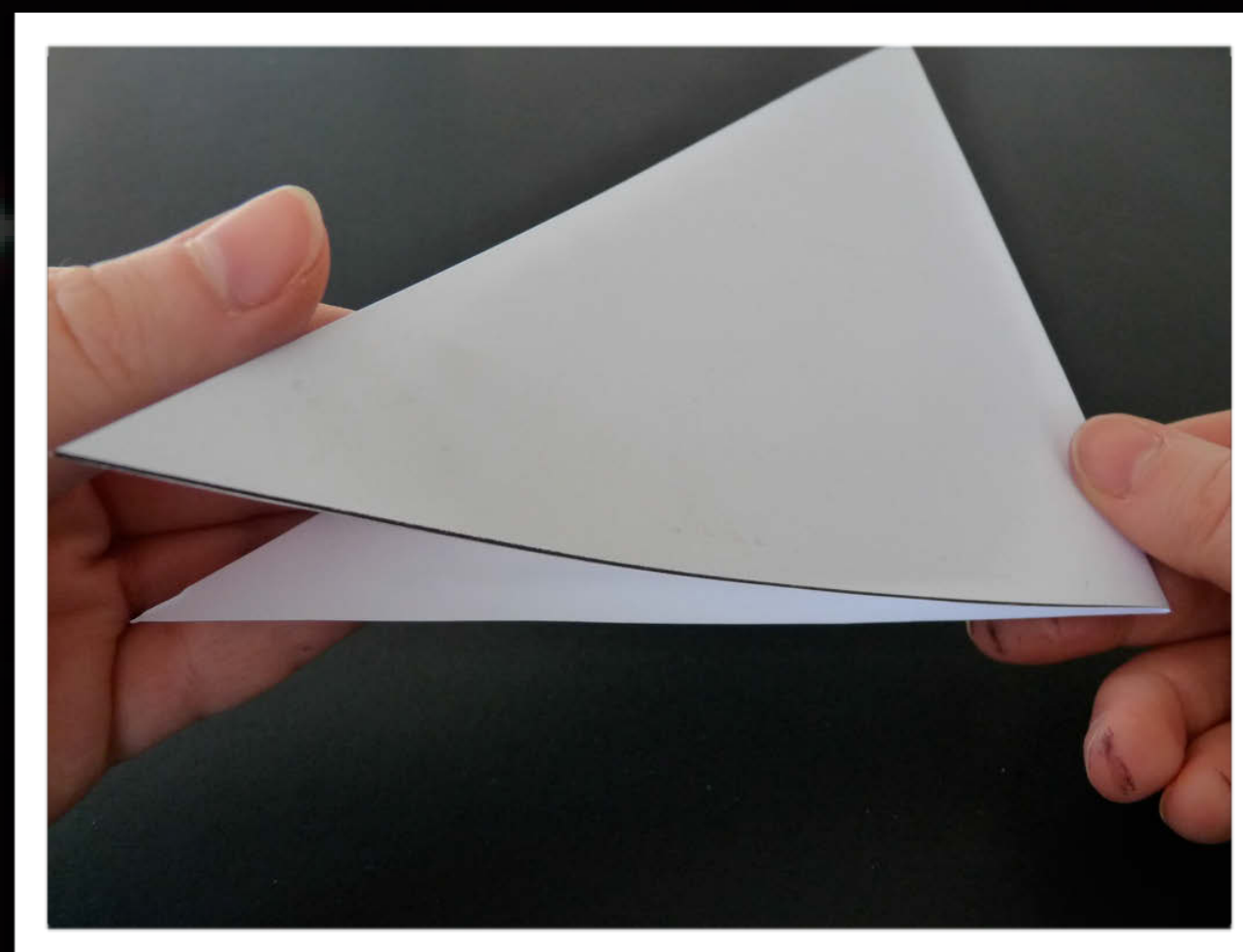
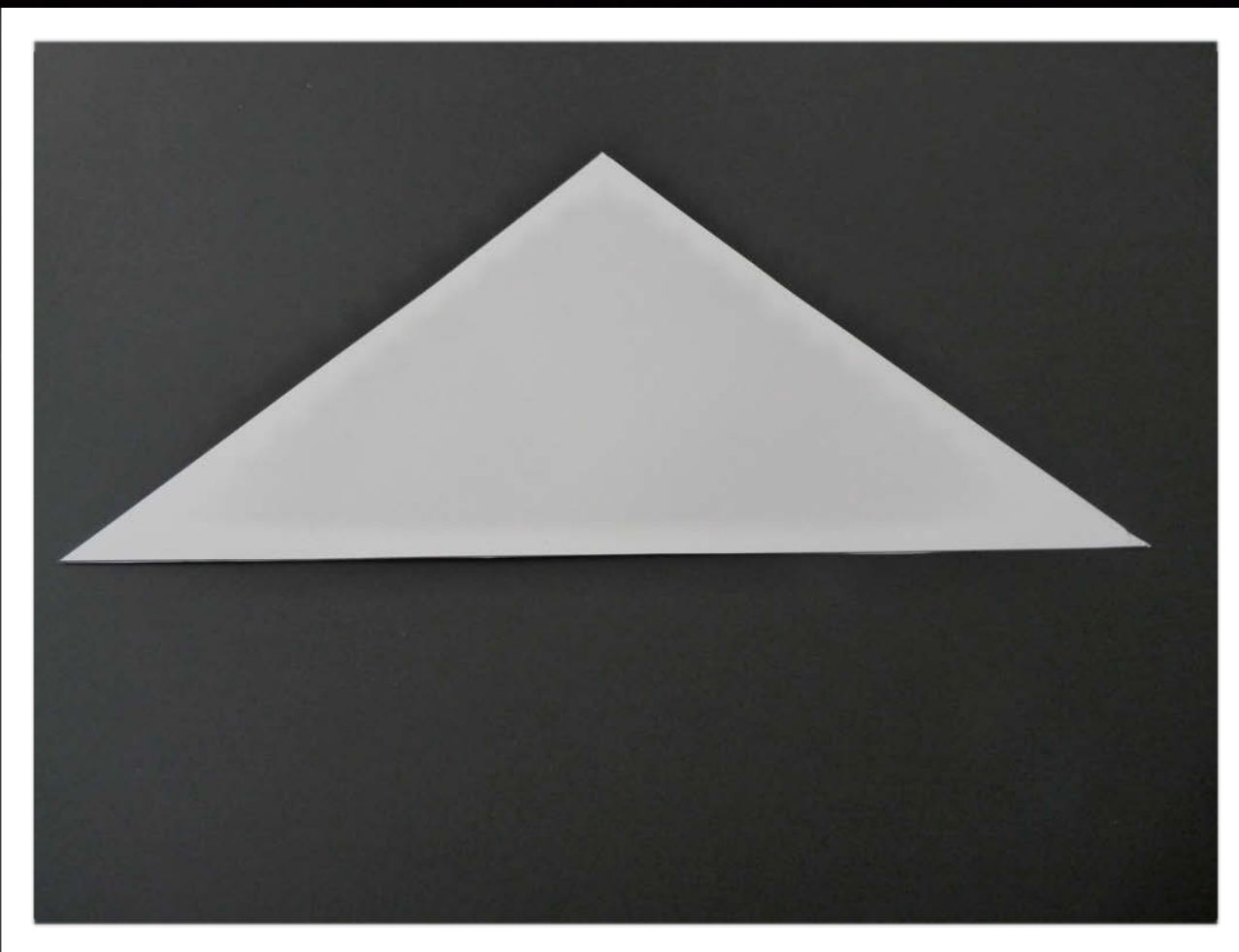
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Write the hours next to each line. The centre line is 12 o'clock.

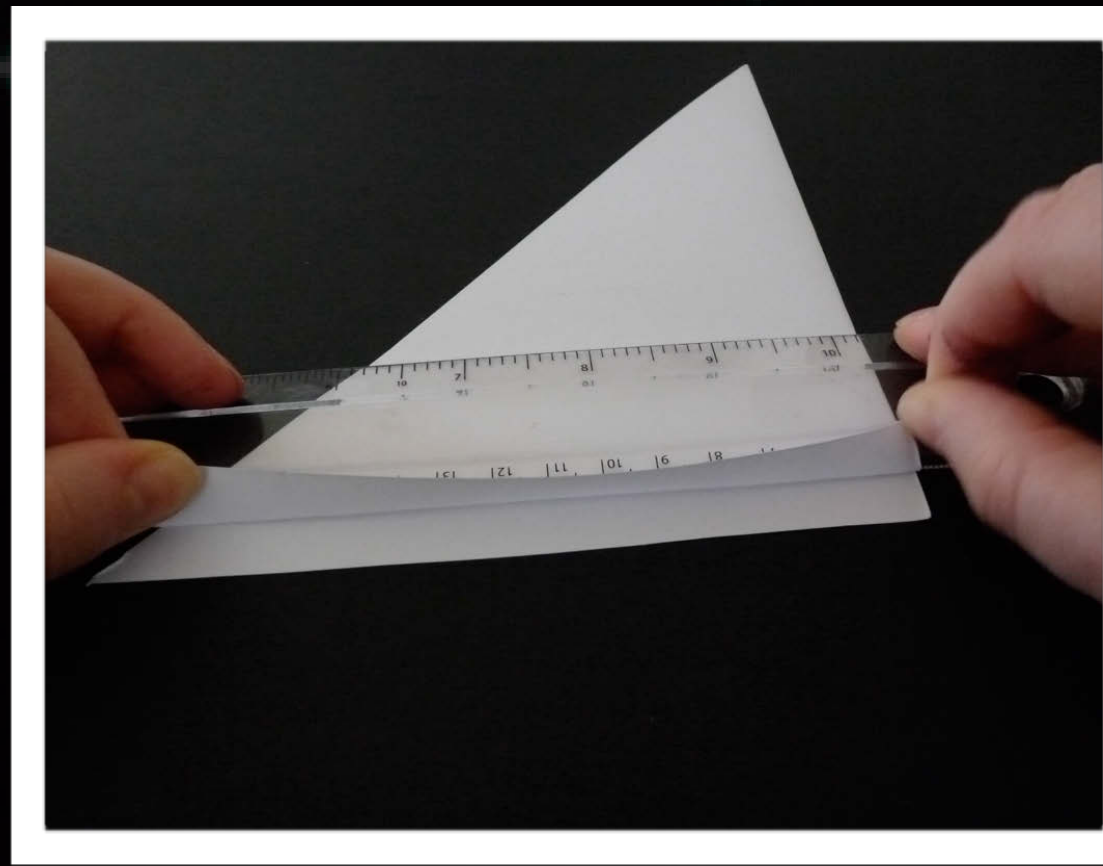
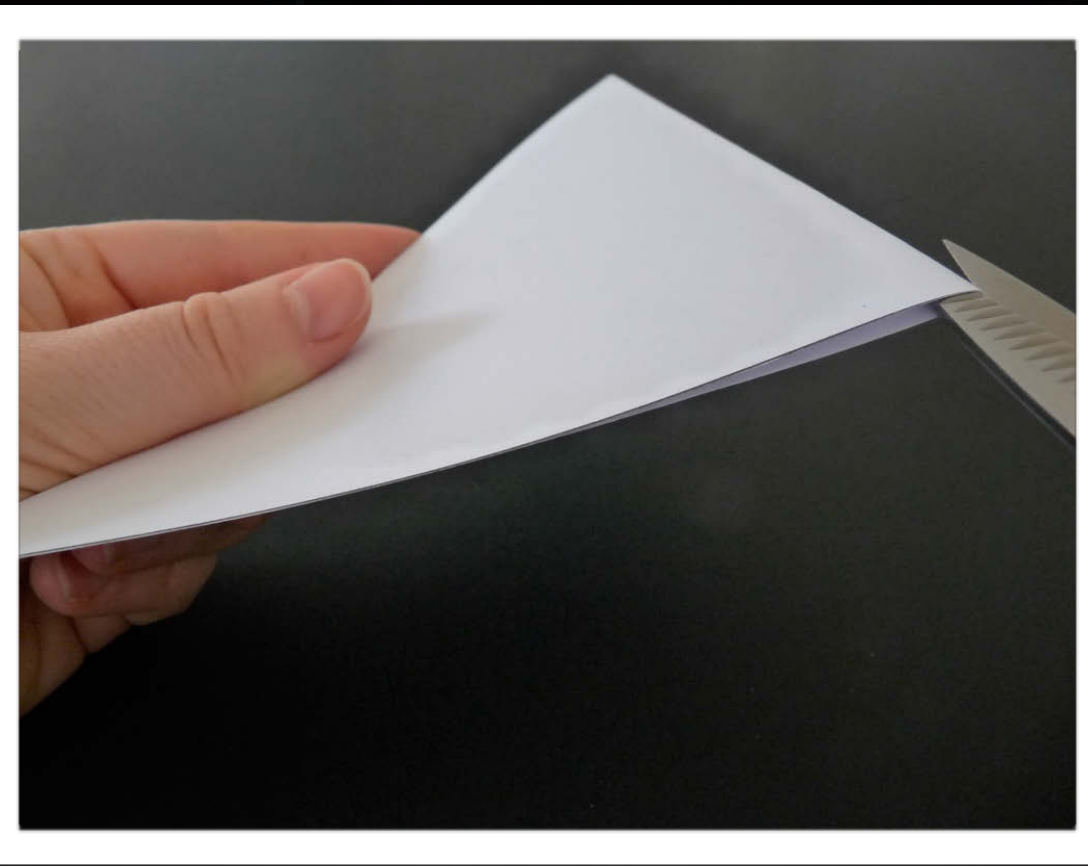


To make the gnomon, cut out a triangle of card and fold it in half.

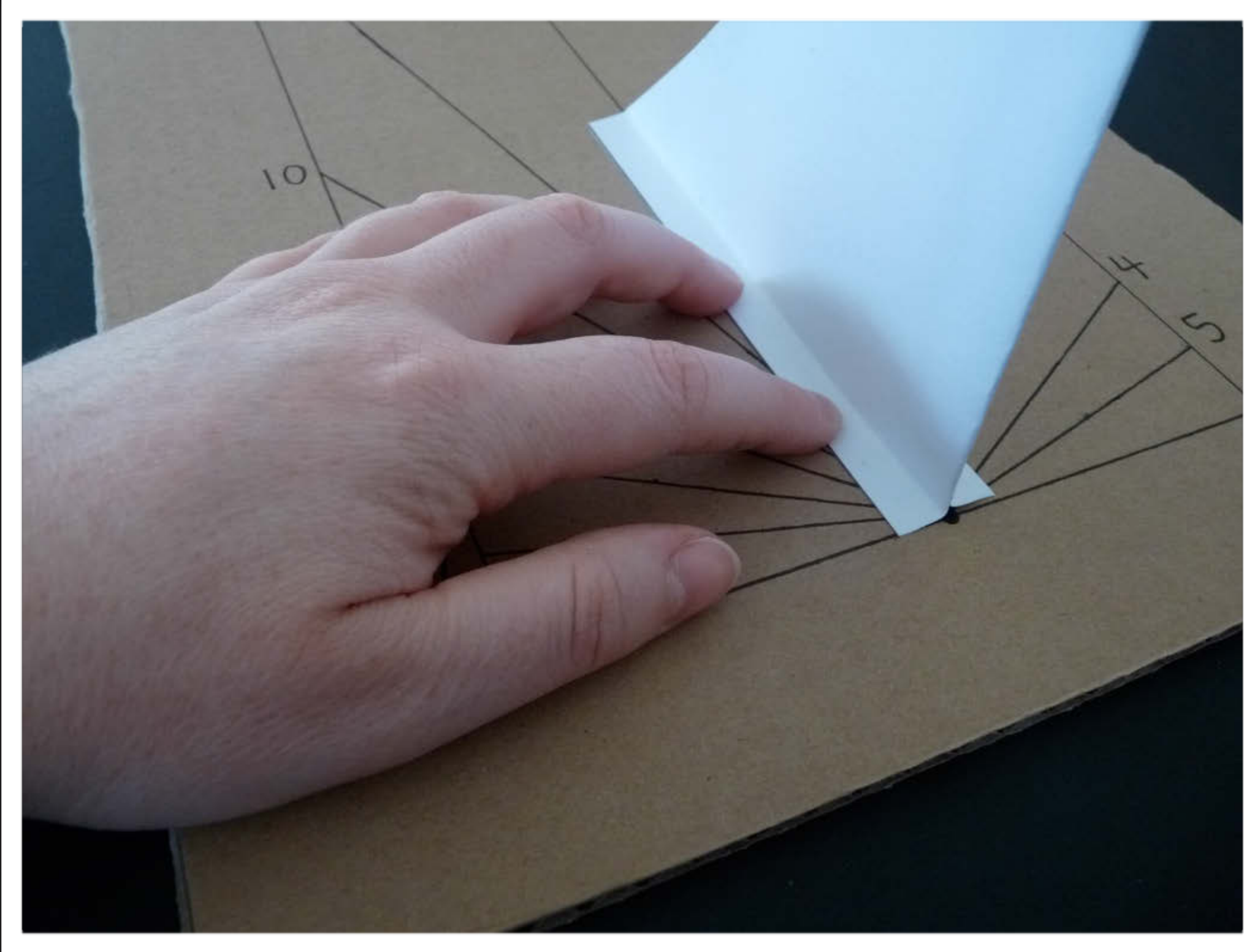
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Cut a small slit down the fold of the triangle (around 1cm) then use a ruler to fold back a flap for each side.



Stick the gnomon onto the base of your sundial so that the edge of the gnomon meets with the horizontal line of the base.

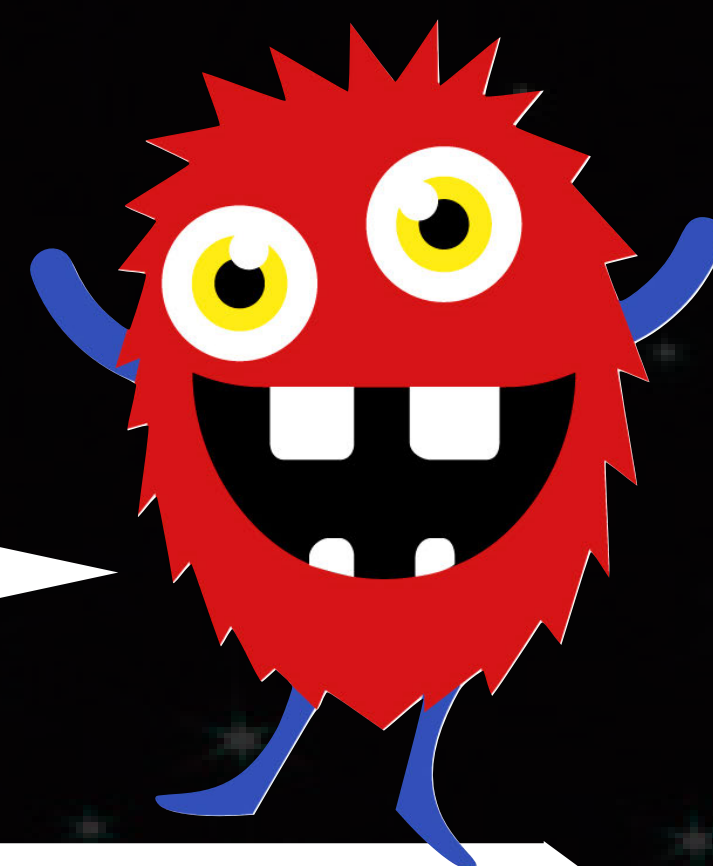
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You now have a basic sundial. But this one is very plain and boring. How could you adapt it and decorate it to make it look better?

Could you take it outside and see if it works?



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What style of sundial do you think you would like to make?

How will you decorate the basic structure of your sundial?



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