

THE BEGININGS OF CLOCKS



Until about 200 years ago, most people in the world worked on the land. They farmed and raised livestock just like the people of the ancient world. Because of this their lives were ruled by the sun. They started work at sunrise. In the middle of the day they paused to eat, when the sun was highest. When the sun set, they stopped work and went home. Although there were several different ways of marking the passage of time, people who worked on the land had no need to own clocks.



The water clock and sundial

A **water clock** showed the passage of time by allowing a measured amount of water to flow from one container to another.

A **sundial** was kept out of doors and used the movement of a shadow to show how time was passing.



Water clocks and sundials were only rough guides to time. There were many attempts to find more precise methods of timekeeping before the invention of the mechanical clock.

The candle clock and sandglass

The **candle clock** was simply a large candle with marks down its length. Time was measured by the amount that the candle had burned down.



The **Sandglass** or **hourglass** was a device which was used at sea. The sand in the top half of the glass took a fixed time to trickle through to the bottom half, about half an hour or an hour. Someone had to stand by the timer to turn the glass upside-down at the end of the period. This was often the job of one of the boys in the crew.

Candle clocks and sandglasses measured only *periods* of time.

They did not show the time of day. Both had an advantage over the sundial, however, in that they could be used at night and on dull days.

Making a sundial

You will need

- thick cardboard
- a flat piece of wood
- scissors, ruler, pen
- glue or sticky tape
- a compass
- a protractor (for measuring angles)

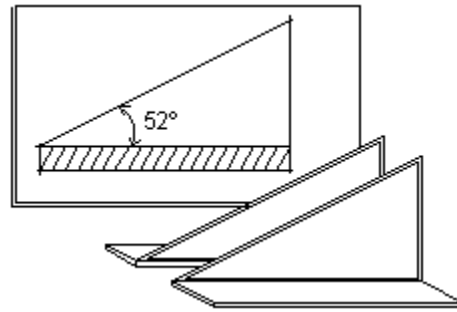
What to do

Look at the diagram on the right. This shows the shape of the shadow marker of your sundial.



1. **Draw two similar shapes on thick cardboard.**

2. **Cut out these shapes and stick them back to back.** Don't stick together the part that is shaded on the diagram.
3. **Draw a half-circle on the piece of wood, in the middle of the half-circle.** Look at the diagram below to help you.



6. **Fix your shadow marker onto the piece of wood, in the middle of the half-circle.** Look at the diagram on the right to help you.
4. **Place your sundial on a flat surface in the sun.** Make sure your shadow marker is pointing towards the South, using the compass to help you.
5. **Mark the position of the sun on the half-circle every hour, on the hour.** Notice that the shadow moves round at a uniform rate.

2.

Look at *The Beginning of Clocks* in your reading booklet. In this passage, we are told that most people had no need to own clocks.

Why was this so?

1 mark

2. The section *Counting Hours* talks about **four** different early ways of showing the passage of time.

Write them here.

1. _____
2. _____
3. _____
4. _____

1 mark

3. Candle clocks and sandglasses were more useful than sundials.

Why?

1 mark

4. (a) *Making a sundial* begins with a list.

Why do you think it starts in this way?

1 mark

- (b) Why do you think certain sentences are written in **bold**?

1 mark

- (c) *Place your sundial on a flat surface in the sun.*

Cut out these shapes and stick them back to back.

Which of these two would you do first?

1 mark

From looking at the instructions, how do you know this?

1 mark

- (d) The information about *The Beginning of Clocks* is arranged differently from the information on *Making a sundial*. What makes the passages different?

1 mark

- (e) Why did the authors choose to arrange the information in different ways?

1 mark

5. The instructions for making a sundial were written for a class of 9-year-olds.

Do you think the instructions are easy to understand for children of that age?

Yes

☐

No

☐

Explain your reasons in the box below

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3 marks