1.

THE BEGINNINGS OF CLOCKS



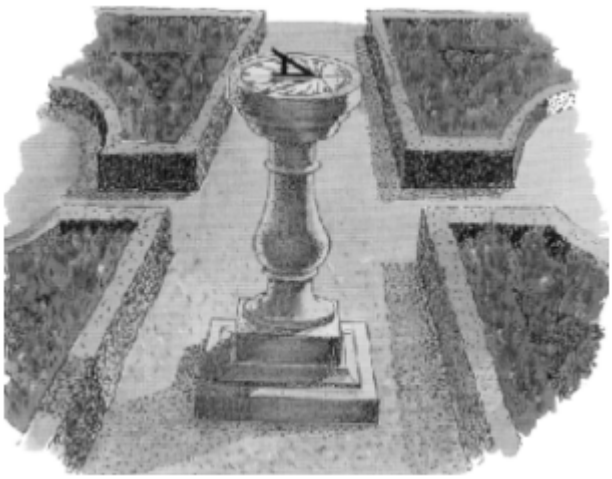
Until about 200 years ago, most people in the world worked on the land. They farmed and raised livestock just like the people of the ancient world. Because of this their lives were ruled by the sun. They started work at sunrise. In the middle of the day they paused to eat, when the sun was highest. When 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 I 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 boy 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

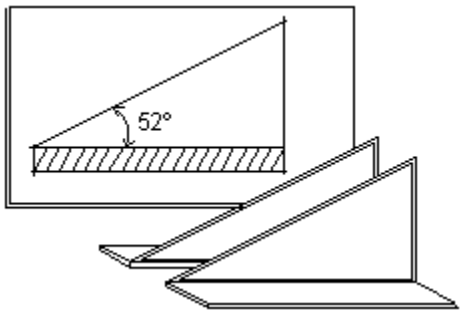
Look at the diagram on the right. This shows the shape of the shadow marker of your sundial.



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.

1. 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

3 marks

2.

1 Accept any answer along the following lines:

- *the movement / position of the sun indicated the time of day / they did not need to know the time precisely / because there were other ways they would tell the time / people who work on the land do not need to know the time.*

1 mark

2 Award **1 mark** only if all four of the following answers are given**:**

- *water clock*
- *sundial*
- *candle clock*
- *sandglass / hourglass*

1 mark

3 Accept any answer along the following lines:

- *they could be used at night and / or on dull days and / or indoors*

1 mark

4 (a) Accept any answer along the following lines:

- *so you can get all the components ready at the outset / getting all the parts is the first thing you need to do to decide whether you can actually make the thing / you can't make a sundial if you can't acquire all the parts*

1 mark

(b) Accept any answer along the following lines:

- *because those sentences are important to draw attention to the parts of the text to show you the main things to do*

1 mark

(c) (i) Award **1 mark** for any answer along the following lines:

- you would cut out these shapes and stick them back to back first

(ii) Award **1 mark** if the response includes an explanation about the ordering of steps in instructions, eg:

- because they were written / numbered in that order
- you do instructions in the order they are written

up to 2 marks

(d) Award **1 mark** for answers which indicate that the styles of presentation differ, eg:

- ***Making a Sundial*** *is arranged in a list*
- ***The Beginnings of Clocks*** *is like a story. It tells you about the history of clocks*
- ***The Beginnings of Clocks*** *is written as a block of text / paragraph / whole line, while* ***Making a Sundial*** *is written in different sections / segments / little bits*
- ***The beginnings of Clocks*** *is written in full sentences while* ***Making a Sundial*** *is written in point form*

1 mark

(e) Award **1 mark** for answers which indicate the purpose of the different texts, eg

- ***Making a Sundial*** *tells you how to make the sundial and the other one just describes clocks / because instructions need to be set out clearly for people to do*

1 mark

5 **No marks awarded for ticking yes/no box.**

The purpose of this question is to elicit the child's opinion about what makes instructions easy or difficult for 9-year olds.

Award **1 mark** for unsupported opinions, eg:

- *no, because it's too difficult*
- *yes, they are simple / easy*
- *they didn't explain what to do very well*

Award **2 marks** for answers in which the opinion takes account of some aspects of the text such as language / layout / illustrations, eg:

- *no, it uses language which is too difficult for 9 year olds.*
- *no, the instructions are not clear, but the illustrations help*
- *yes, it has a lot of useful information in the instructions*

Award **3 marks** for answers which consider more than one aspect of the text and explain how these contribute to the overall ease or difficulty, eg:

- *no, the words alone are not clear enough. They don't actually tell you that you have to draw a shadow marker, you have to guess that by looking at the illustrations*
- *Yes, there are diagrams and a list of what you need also it's broken down into simple steps*

up to 3 marks