

# Winter Solstice Maths Investigation

The winter solstice occurs once a year around 21st December. It is the point at which the length of daylight in the UK and the northern hemisphere are the shortest they get.

You will need a pencil, a pair of compasses, a protractor and a ruler.

## Your Task:

On the following sheet, you will see a blank diagram showing the Sun in the centre and a line around it tracking the orbit of the Earth. Your task is to draw in the Earth at the correct angle in four of its positions.

## Using all your equipment, you will need to:

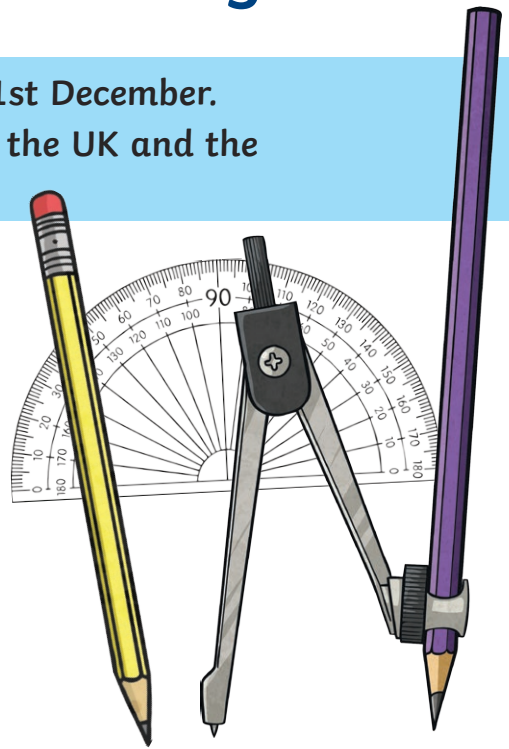
- notice that the position of the summer solstice has been labelled already;
- draw and label the circular Earth at the four places it gets to - the winter solstice, summer solstice, spring equinox and autumn equinox;
- draw the axis which will show the Earth's tilt;
- measure accurately where each Earth will be so that they appear quarterly;
- draw arrows on the orbit path to show the direction of movement;
- draw the equator on each Earth;
- label the hours of daylight at the North Pole for each Earth diagram.

## Extra Challenges

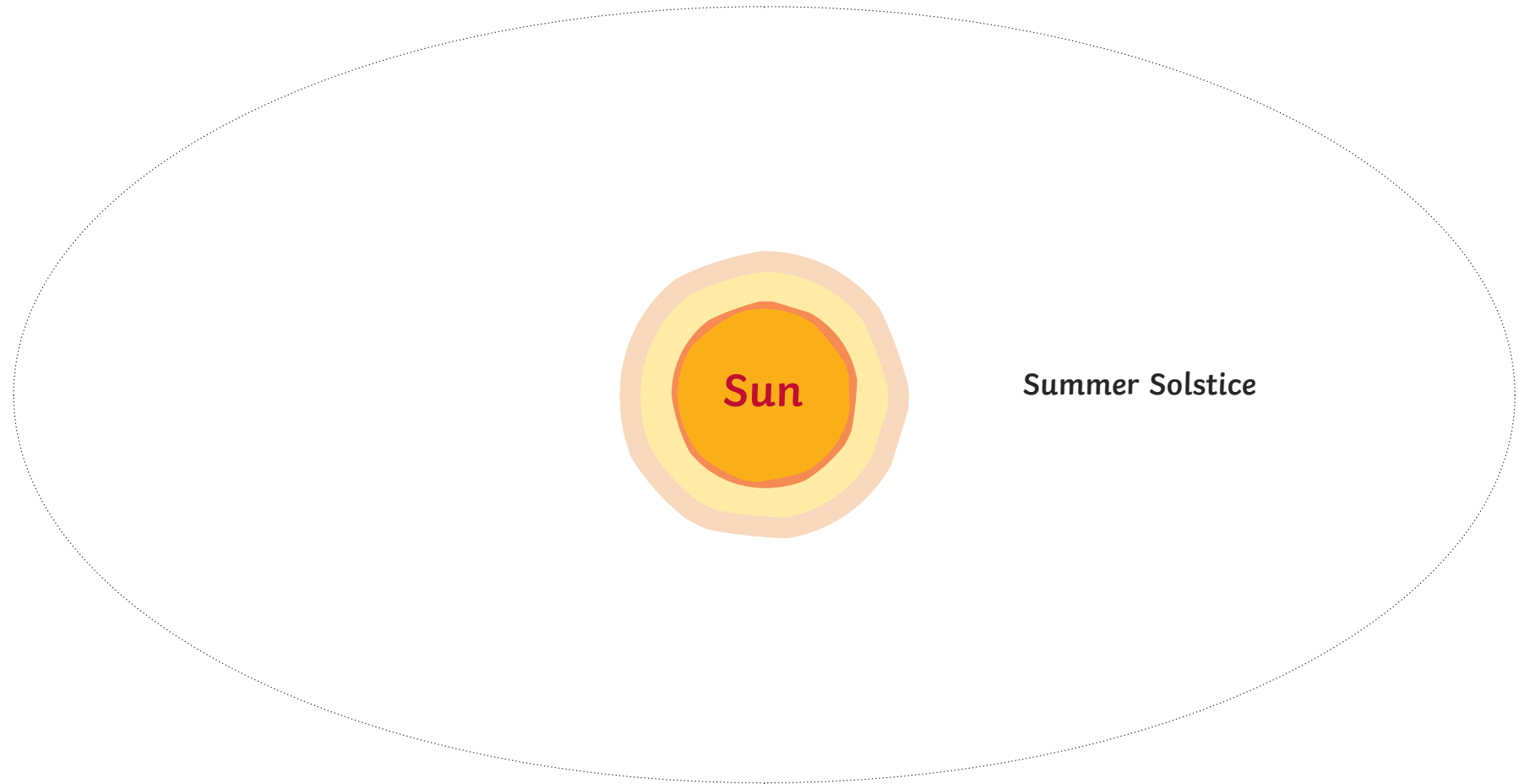
- Label the season of the southern hemisphere at each point.
- Label the hours of daylight at the South Pole for each diagram.

## You will need to know:

- The Earth travels anticlockwise around the Sun.
- The Earth is tilted at an angle of  $23.5^\circ$  (but an angle of  $24^\circ$  is fine for this task).
- During winter, the northern hemisphere (including the UK) is tilted away from the Sun.
- During the winter, the North Pole is in total darkness and there is no daylight.
- During summer, the northern hemisphere (including the UK) is tilted towards the Sun.



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# Winter Solstice Maths Investigation **Answers**

The black labels refer to the northern hemisphere seasons and daylight.

The grey labels in brackets refer to the southern hemisphere for those children attempting the challenges.

