



Changing Times

Planisphere Activity

Classroom Activity

Overview

Age Range:

14-18

Prep. Time:

30 minutes

Lesson Time:

1 hour 10 minutes

Cost per activity:

Medium (Rob Walrecht Planisphere at €10 each)

Includes the use of:

Planispheres (40, 50 or 60N)

Outline

Students will discover that stars move east to west across the sky because the ground beneath their feet is moving west to east as the Earth rotates. The Earth also orbits around the Sun in an anticlockwise direction as viewed from above the north pole. As a result, the stars appear approximately 1-degree further west each day and rise above the eastern horizon 4 minutes earlier. Our hours and day are set by the solar day (24 hours), the average time for the Sun to be at the meridian (midday) from one day to the next. The Earth actually completes one 360-degree rotation in 4 minutes less time; this is the sidereal day, 23 hours and 56 minutes.

Pupils will Learn:

- Using a planisphere and obtaining readings from it
- Simple calculations

Lesson Plan:

Overview of the time required to complete lesson.

Description	Time	Notes
Introduction to the subject	15 min	Brief familiarization with the planisphere. By this stage students should have mastered its functions.

Online Observatory: onlineobservatory.eu

The online observatory collaboration consists of the following partners:

Baldone Observatory, Brorfelde Observatory, Cardiff University, Harestua Solar Observatory, Helsinki Observatory



Activity 1	25 min	
Assessment	30 min	Comparing answers. Understanding the solar and sidereal day (length).

Introduction to the subject:

If you have not already you may wish to go through the previous activities about using the planisphere, including 'CalibratingYourPlanisphere' and the 'planisphere' activity.

Activity 1:

- Divide students into pairs (or larger depending on planisphere availability) and distribute planispheres between them

Introduce the activity, taking special care to cover/revise how the planisphere functions and what it is.

1. The students should follow the instructions provided in their student guide and use the planisphere to answer the questions provided.

Assessment:

- Mark students work using the model answers 'ModelAnswers_ChangingTimes'

A sidereal day is the time taken for the Earth to rotate 360 degrees. This is 23 hours and 56 minutes. The solar day is the (average) time for any object in the sky (stars or the Sun) to reach the same position from one day to the next. The Earth moves around its orbit as well as rotates so, to put an object back at the same point in the sky, it has to rotate a little more than 360 degrees, about 361 degrees in fact. Thus, a solar day is 4 minutes longer than a sidereal day, i.e. 24 hours.

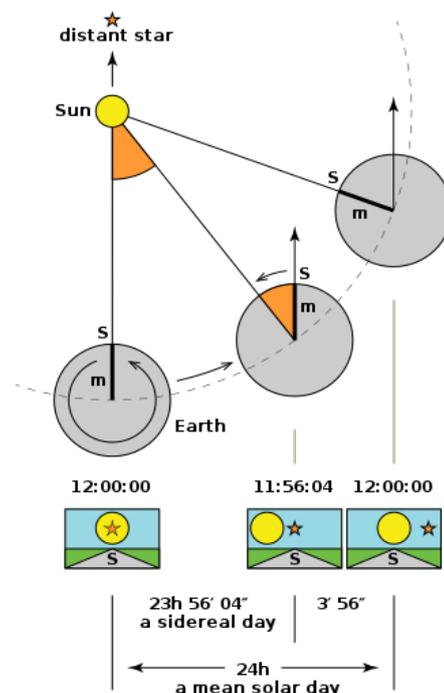


Image: Wikimedia Commons