

## **I. Objectives**

1. Define terms related to astronomical time.
2. Investigate the differences among different types of calendars, how they were established, and how they are related to the study of astronomy.
3. Work as a member of a team in a coordinated research effort.
4. Use your creativity and critical thinking skills in organizing, displaying, and evaluating your group's materials.
5. Share and communicate what you have learned with others both in and out of class.
6. Create a professional and informative poster.

## **II. Introduction**

Historically, the regular motion of objects in the sky served as the basis for timekeeping. The diurnal motion of the sky caused by the rotation of the Earth on its axis defined the day, the year was defined by the motion of the Earth on its orbit about the Sun, and the month was defined in relation to the revolution of the Moon about the Earth. Although precise modern timekeeping is done electronically, many of the details and the terminology of timekeeping remain rooted in its astronomical heritage (Timekeeping).

The earliest time measuring devices used either the shadow cast by the Sun or the rate which water runs out of a vessel. Both methods were in use before the earliest historical records. Early systems for dividing the day and night into hours used a simple division into twelve parts regardless of season (Time Leaflet).

There are two basic sources for calendars presently in use: the monthly motion of the Moon, tracked by lunar calendars, and the yearly motion of the Sun, tracked by solar calendars. The difficulty with lunar calendars is that the seasons are correlated with the Sun, not the Moon. Thus, lunar calendars require elaborate adjustments or translations to relate to the seasons. That calendars correlate with seasons is now primarily a matter of convenience, but in more ancient cultures keeping track of the seasons was serious business. It could be a matter of survival to know things like the proper time to plant to ensure a bountiful harvest (Calendars).

**III. Prelab Definitions**

1. day
2. week
3. month
4. year
5. leap year
6. atomic time
7. civil time
8. local time
9. sidereal time
10. solar time

**IV. Prelab Questions**

1. Why do societies use calendars? What information do calendars provide?
2. Why is it important for those studying astronomy to have some knowledge of time and calendars?
3. Which calendar do we currently use and why do we use it?
4. What is the Greenwich prime meridian and where is it located?
5. What is the International Date Line and where is it located?
6. What is the equation of time?

**V. Lab Procedure**

1. You and your team members will create a poster on one of the following calendars: Aztec, Babylonian, Chinese, Egyptian, Greek, Hebrew, Incan, Indian, Islamic, Mayan Roman, or another calendar of your choice. If you decide to select a calendar that is not on this list, talk with your instructor before you begin your research.
2. You will then need to locate materials related to your calendar, which may include myths, historical descriptions, maps, drawings, photographs, and written information about the calendar, or other materials.
3. You **may** use whatever sources you like but you must keep track of the sources for everything that you obtained from the Internet, magazines, books, etc. and information about that source must be included when you place the material on the poster.
4. You **may not** simply copy and place materials located from the sources above. You will need to coordinate your materials with the other members of your team, and remove materials that are not relevant. **All text must be typed.**
5. Everyone in your team will receive the same grade (unless a team member doesn't cooperate and participate). There is a maximum of 15 points available for this lab and your completed poster, which must be done by the date indicated on the syllabus.
6. Your grade will be based on:
  - a. organization: are the materials you selected well organized on the poster?
  - b. research: were your research efforts adequate and appropriate in locating a wide variety materials listed in 2. above?
  - c. clarity: did you select materials that can be understood by others both in and out of the class?
  - d. conciseness: did you only include materials that are relevant to items listed in 2. above?
  - e. professionalism: does your poster have a professional appearance? is it interesting and informative?

