Time and Seasons

Previsit Material

Program Overview

From Egyptians to Native Americans, all cultures developed their own way of timekeeping that was conducive to their lifestyle. This program encourages students to learn about the different methods that people have developed to keep time and how the concept of time relates to everything that we do. This pre-visit material gives the instructor background material relating to the concept of time, the development of calendars to track the seasons, suggested pre-visit activities, as well as resource material. As part of the students' museum visit, the students will create some of the early timekeeping devices.

Instructor: Please review materials and complete the pre-visit activities as time permits. This background information is a key component of student success with the program.

Pennsylvania Education Standards Met:

Listening and Reading: 1.1, 1.2, 1.6
Science: 3.1, 3.7
Mathematics: 2.1, 2.3
History: 8.1, 8.4
Art and Humanities: 9.1, 9.2

Suggested Grades 3-6

Special points of interest

- Math
- Science
- Listening
- Reading
- History
- Art

Inside this guide

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Lesson: Discovering Time

Teacher Background Information:

Time is very important in our lives. Nearly everything we do we measure by the time that it takes to complete. Time tells us when to begin an activity, when to stop doing something, and how long we have been doing it. For thousands of years people have developed different units of time that measure its duration. A clock is a device that tells us what time it is or how much time has passed. A calendar is another type of time measurement that allows us to know when a large amount of time has passed.

Through this activity students will think the lengths of different periods of time and how they relate to everyday activities.

Student Activity

1. Use the following questions to prompt a discussion with your students about the concept of measuring time.

   Ask the students: Do you wear a watch? Why do you wear it? How do you know when it is time to do something? How do you know how long it takes to do something?

2. Review with students the seven different units by which we measure time and the period of time each unit covers.
3. Have students work in partners or small groups to measure the time it takes them to complete a task. You may want to give each group a stopwatch or use a classroom clock with a second hand to complete the following experiments.

   A. Drop a pencil from above your head. How long does it take to fall to the ground.

   B. Find your pulse. How many times does it beat in one minute.

   C. Have a partner count how many times you wink in thirty seconds.

4. After students have completed some of the measuring time activities, have each student complete the *Time: How long will it take?* worksheet.

Name: _____

Time: How long will it take?

A) Label the seven most common units of time measurement.

S_____ , m_____ , h_____ , d_____ , w_____,

m_____ , y_____

Now use the units to suggest which one you might use to measure:

1. How long you are in school today?
2. How long it will take you to eat your lunch?
3. How long until your next birthday?
4. How long until the end of the month?
5. How old you are?
6. How long it takes you to learn your spelling words this week?

B) Think of two things you could do that would take you…

1. 1 minute
2. 10 minutes
3. 1 hour
4. 30 seconds
5. 2 weeks
6. 5 hours
7. 1 year

C) For each of the following activities, write down which one of the three given times is the most accurate.

1. To make a peanut butter and jelly sandwich in 3 minutes, 30 minutes or 3 days.
2. To run across the playground in 15 minutes, 15 days, or 15 minutes.
3. To walk home from school in 20 minutes, 2 minutes, or 2 hours.

Lesson: Sun Time

Teacher Background Information:

People from many centuries past did not have clocks as we know today to tell the time. They relied on the sun, moon, growth of plants and crops, and the changing of the weather to tell how time was passing. The ancient Egyptians developed a clock around 3500 BC known as the shadow clock. This clock was a stick that cast a shadow as the sun moved past. Around the eighth century BC, they made improvements to the clock and the result was the sundial. Sundials used a stick or pointer called a gnomon to cast a shadow on a flat surface marked with the hours. Sundials varied in size, from very large ones found in a courtyard, to ones that would fit into your pocket.

Through this lesson students will learn about an ancient method of telling time by creating and observing a sundial.

Student Activity

Ask the students: How would we measure time without a clock? We know that the sun moves throughout the sky during the day. Can we tell what time it is by looking at the position of the sun in the sky?

1. Explain to students the concept of using the sun to determine the time of day. Find pictures of sundials to show to the class. Explain how a sundial tells the time.
2. Have students work in small groups to make several sundials using the following materials for each: flowerpot filled with sand, a 12-inch stick, masking tape, and a pencil or marker.
3. Take the sundials outside with your class, making sure to set them in the sun. Have each group of students mark with a piece of masking tape where the shadow of the stick falls on the edge of their pot. Put the hour on the piece of masking tape.
4. Repeat activity every hour. Compare the sundials. Do they match each other? How are they different? Why might a sundial be a good timekeeping device? Why might it not be a good timekeeping device?

Lesson: Lunar Time

Teacher Background Information:

Thousands of years ago, people needed to keep track of time for planting seeds and celebrating religious holidays. After watching the moon, people realized that it moved in a regular cycle. One complete cycle was named a "month," which is 29 1/2 days, or time period it takes the moon to circle the Earth. By counting the moons, people could measure the passing of a year. A written calendar, referred to as a lunar calendar, was developed around the cycles of the moon. The earliest calendars created by the Sumerians only had two seasons: summer and winter. The Egyptian calendar had three seasons: planting, harvest, and flood.

Through this lesson students are encouraged to think about our calendar and alternate calendars. It also raises their awareness of the moon.

Student Activity

Ask the students: How useful are the moons monthly cycles in constructing a calendar? Are there any difficulties involved with basing a calendar on the lunar cycle? Is seven a good number of days per week? Could we have five days in a week or 10?

1. Review with students the different phases of the moon.
2. Give each student a calendar with the moon phases. Students should count and write down the number of days between full moons.
3. Give the students the following questions to answer. Is this number the same? What about the number of days between quarter moons? Waning? Crescents? Waxing crescents?

4.Students should try to devise calendars based on their observations and calculations. They must decide where in the moons cycle to begin the month. They may name their months. (You may want students to work in small groups for this activity.)

Materials Needed:

Calendar for current year with moon phases

Pencil

Paper

Lesson: Cultural Calendars—Native American

Teacher Background Information:

Calendars are a way of keeping track of time. Today most of the world uses the Gregorian calendar, although there are many countries and religions that have their own calendar to denote holy days and festivals. The earliest calendars were based on the movement of the moon and then, later, the movement of the sun.

Native Americans had many unique ways of tracking their years. The Lakotas tracked their years by using a winter count, a mnemonic device used to record noteworthy events in tribal life. Passed down from one generation to the next, historic events were recorded on animal hides in the form of pictures. Each winter the keeper of the winter count would draw a picture of the most important events of the year. The elders of the tribe and the keeper of the winter count chose the event. The keeper of the winter counts would then read the story of the winter counts each winter, passing on the history orally.

Through this lesson students will gain experience establishing a sense of order and time by sequencing events. They will also learn about a different culture's method of timekeeping.

Student Activity

Ask the Students: What are calendars for? How do we use them? What different kinds of calendars are there? (i.e., Lunar, Jewish, astrological, daily, weekly)

1. Instruct the students to write down the most memorable event that occurred the day before.
2. Provide background information on the Lakota. Introduce the winter counts. Show images of the winter counts (see Smithsonian's online exhibit http://wintercounts.si.edu).
3. Explain how the winter counts were used by the Lakota to remember their community's history.
    a. Each pictograph represents a memorable event that occurred during each year of the community's history.
    b. The pictographs are arranged in chronological order.
    c. One person, the keeper, was responsible for meeting with important members of the community to discuss which event would represent the preceding year.
4. Ask the students to share the event they selected and have them choose, as a class, one event to represent the class's shared history. Guidelines for selection are:
    a. It must be an event that was common to the entire class.
    b. It must be an event that is unique to that day and has little chance of recurring tomorrow or later that week.
5. Once the event has been decided on, have each student draw an image that depicts the event. At the end of the lesson, collect and display the images so that students can see how their pictographs were similar or different to those made by their classmates.

Lesson: Cultural Calendars: Mayan

Teacher Background Information:

The Mayans had a very unique calendar system. They used two calendars, the *Tzolkin,* or sacred calendar, which kept track of religious days, and the *Haab*, which was based on the solar year. Both calendars were based on the movements of the Sun, Moon, and planets. On a Mayan calendar, a day was referred to as a *kin* and a month (20 days) was a *uinal*. Each day, or kin, was represented by a picture or hieroglyphic.

Through this lesson students will develop their own symbols for the days of the week, based on the Mayan calendar.

Student Activity

Ask the students: Do we use symbols in our culture to represent words?
What other cultures use symbols to represent words?

1. Give students background information on the Mayans and their calendar system. Choose from the suggested readings in the back of this guide.
2. Have students choose a partner or assign a partner.
3. Have the students write down both of their first names.
4. Make up one kin (day) name for each of the seven days of the week using a combination of letters from both their names.
5. Together draw a picture to represent each kin.
6. Display the kins for the class to see.

Materials Needed:

Paper

Crayons, marker

Suggested Bibliography

Student Reading—

Braman, Arlette N. and Nidenoff, Michele. *Secrets of Ancient Cultures: The Maya-Activities and Crafts from a Mysterious Land.* Hoboken: John Wiley and Sons, 2003.

Catherall, Ed. *Clocks and Time.* Morristown: Silver Burdett Company, 1982.

Davies, Kay and Oldfield, Wendy. *The Super Science Book of Time.* New York: Thomson Learning, 1993.

Kummer, Patricia. *The Calendar.* Franklin Watts, 2005.

MacDonald, Fiona. *Aztecs and Maya.* Southwater, 2001.

Maestro, Betsy Maestro. *The Story of Clocks and Calendars: Marking a Millennium.* New York: Lothrop, Lee, & Shepard Books, 1999.

Websites:

http://webexhibits.org/calendars/index.html

http://wintercounts.si.edu

Materials prepared by

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About...

the National Watch and Clock Museum

The National Watch and Clock Museum officially opened to the public in 1977 with a little more than 1,000 objects. Since that time the collection has increased to over 12,000 objects. The collection is international in scope and covers a wide variety of clocks, watches, tools, and other time-related items. The museum is recognized as the largest and most comprehensive horological collection in North America.