

## Automobile Models from Clay

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. A life-size model of a car is \_\_\_\_\_.

(A) four-tenths scale  
(B) full scale  
(C) a smaller scale

2. A milling machine can be compared to \_\_\_\_\_.

(A) an oven  
(B) a wind tunnel  
(C) a drill bit

3. Compare the work of an automobile designer and a clay modeler.
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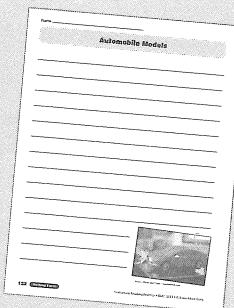
4. Describe the kinds of math used in making clay automobile models.
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5. Do you think a car can be considered a work of art? Give your reasons.
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### Write About the Topic

Use the Writing Form to write about what you read.

You are interested in a career as an artist with a car company. Describe the skills you will need to learn.



# **Calendars in History**

## **Level 1**

## Words to Know list, Reading Selection, and Reading Comprehension questions

**Calendar Changes**

Fill in the circle to complete the sentence.

A calendar is an easy way to keep track of the days, weeks, months, and years. Books need simple and big. But it is made of O mathematical puzzle than you might think. The dates we use today has been around since ancient times.

In centuries of thousands of years, people switched the months, signs, years, and days at the time. We know that the moon becomes new every 29 days. The moon's changes matched the months in the calendar.

There was a problem, however. The sun, the moon, and the months the seasons. It takes a year for the sun to travel the zodiac. That is about 365 1/4 days. The calendar added up to less than that. As years went by, the calendar and the seasons no longer matched up. It was hard to keep track. What did they do?

Julian Caesar, a Roman ruler in 46 B.C. The calendar had become three days off of step with the seasons. He decided to change the calendar. September Julian Calendar became the first month. He would have 31 days, October would have 30 days, November would have 31 days, December would have 30 days, January would have 31 days, February would have 29 days. Every year would be a leap year, when February would have 28 days. Now the years had 365 1/4 days. The calendar and of leap years was used to move the sun from a millennium. But a calendar still had 11 minutes and 14 seconds off. To make up the minutes and seconds, he had to add one extra century. The calendar was off and had 365 1/4 days off. In 1500 the calendar was off and added up to seven days.

Near the end of the 16th century, the calendar was off ten days off. Pope Gregory XIII changed it in 1582. He ordered 10 days from October to be removed. He redrew the calendar rules for making leap years. It became known as the Gregorian calendar. This calendar is used almost all over the world today.

National Endowment for the Humanities

**Words to Know**

**Calendar Changes**

centerly  
mathematical  
puzzle  
centuries  
controls  
orbit  
Julius Caesar  
B.C.  
millennium  
century  
Gregorian

**Calendar Changes**

Julian Calendar: Roman calendar in which there were 365 1/4 days per year. It was off by three days of step with the seasons. It was replaced by the Gregorian calendar.

Gregorian Calendar: Julian calendar that was replaced by Pope Gregory XIII in 1582. It has 365 days per year. It is the calendar used almost all over the world today.

**Calendars in History**

**Level 2**

## Words to Know list, Reading Selection, and Reading Comprehension questions

**Level 3** ■ ■ ■

## Words to Know list, Reading Selection, and Reading Comprehension questions

A collage of various calendar-related illustrations and text snippets. At the top center is a small box labeled 'Calendar History'. Below it is a large box containing the text 'Fill in the circle to complete...'. To the right is a box with the text 'and S.' and 'Words to Know' followed by a list of terms: mathematical puzzle, centurie, millenia, ancient orbits, lunar solar, observed floodwaters, created millennium century, and Gregorian. In the bottom left corner is a box for '128 Calendars in History B&W'. The bottom right corner contains a snippet from 'National Teacher's Plan' with the text 'We will be the last to see the Pope's Gregorian calendar'.

## **Assemble the Unit**

Reproduce and distribute one copy for each student:

- Visual Literacy page: The History of Calendars, page 131
  - Level 1, 2, or 3 Reading Selection and Reading Comprehension page and the corresponding Words to Know list
  - Graphic Organizer of your choosing, provided on pages 180–186
  - Writing Form: The Calendar, page 132

## Introduce the Topic

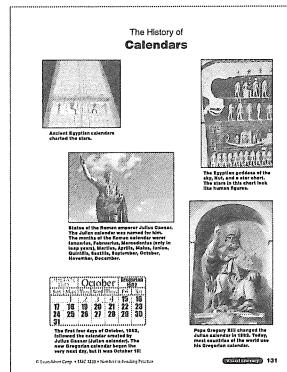
Review the images and text with students. Explain that calendars measure and record the passing of time. Calendars were not always accurate, and for this reason, they have changed through the millennia.

## **Read and Respond**

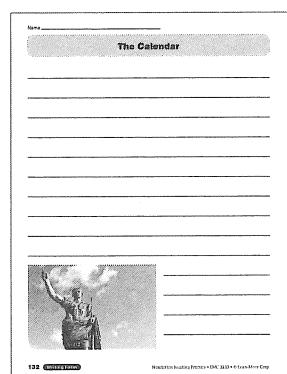
Form leveled groups and review the Words to Know lists with each group of students. Instruct each group to read their selection individually, in pairs, or as a group. Have students complete the Reading Comprehension page for their selection.

## **Write About the Topic**

Read aloud the leveled writing prompt for each group. Tell students to use the Graphic Organizer to plan their writing. Direct students to use their Writing Form to respond to their prompt.

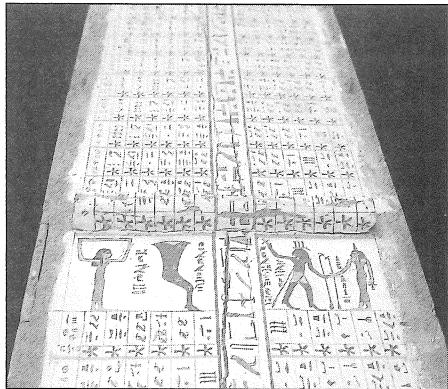


Visual Literacy

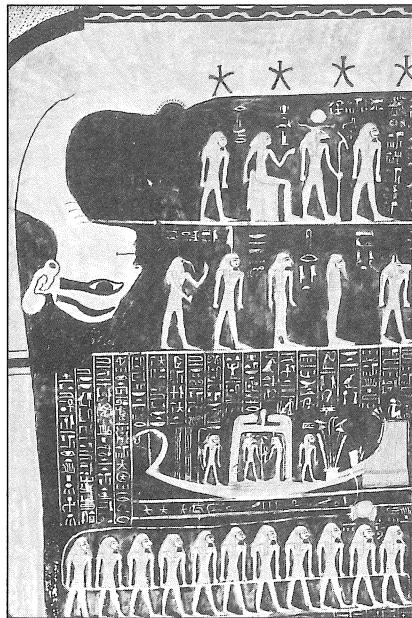


## Writing Form

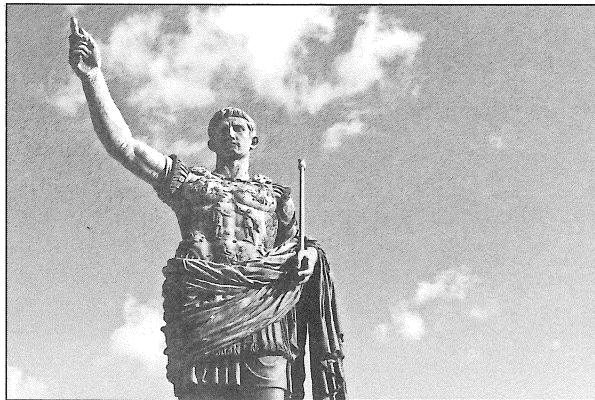
# The History of Calendars



Ancient Egyptian calendars charted the stars.



The Egyptian goddess of the sky, Nut, and a star chart. The stars in this chart look like human figures.



Statue of the Roman emperor Julius Caesar. The Julian calendar was named for him. The months of the Roman calendar were: Ianuarius, Februarius, Mercedonius (only in leap years), Martius, Aprilis, Maius, Iunius, Quintilis, Sextilis, September, October, November, December.

JULIAN 1582		October					Gregorian 1582	
Sun	Mon	Tues	Wed	Thurs	Fri	Sat		
	1	2	3	4	15	16		
17	18	19	20	21	22	23		
24	25	26	27	28	29	30		
31								

The first four days of October, 1582, followed the calendar created by Julius Caesar (Julian calendar). The new Gregorian calendar began the very next day, but it was October 15!



Pope Gregory XIII changed the Julian calendar in 1582. Today, most countries of the world use his Gregorian calendar.

# The Calendar



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## **Words to Know**

### **Calendar Changes**

orderly  
mathematical  
puzzle  
centuries  
controls  
orbit  
Julius Caesar  
B.C.  
millennium  
century  
Gregorian

### **Calendars in History ■**



## **Words to Know**

### **Ancient Calendars**

millennia  
ancient  
unit  
repeat  
Egyptians  
cycles  
observed  
regular  
calculated  
divided  
lunar  
equaled  
controls  
orbit  
solar

### **Calendars in History ■ ■**

## **Words to Know**

### **Calendar History**

mathematical  
puzzle  
centuries  
millennia  
ancient  
orbits  
lunar  
solar  
observed  
floodwaters  
created  
millennium  
century  
Gregorian

### **Calendars in History ■ ■ ■**

# Calendar Changes

A calendar is an orderly way to keep track of the days, weeks, months, and years. It looks neat and simple. But it is more of a mathematical puzzle than you might think. The calendar we use today has seen centuries of changes.

For millennia (thousands of years), people watched the seasons, sun, moon, and stars to mark the time. They saw that the moon became new about every 29 days. The moon's changes marked the months.

There was a problem, however. The sun, not the moon, controls the seasons. It takes a year for the Earth to orbit the sun. That is about 365  $\frac{1}{4}$  days. Twelve months added up to less than that. As years went by, the months and the seasons no longer matched up. It was hard to keep track. What to do?

Julius Caesar ruled Rome in 46 B.C. The calendar had become three months out of step with the seasons. Winter started in September! Julius Caesar ordered a change. The calendar would have 12 months. The months had either 30 or 31 days, except February, which had 29 days. Every four years was a leap year, when February would have 30 days. Now the years had 365  $\frac{1}{4}$  days. This kind of leap year calendar was used for more than a millennium. But a calendar year was still 11 minutes and 14 seconds too long. The minutes and seconds added up. In two centuries, the calendar was one and a half days out of step. In 1,000 years the difference added up to seven days.

Near the end of the 16th century, the calendar was ten days out of step. Pope Gregory XIII changed it. He dropped ten days from October of 1582. He ordered new mathematical rules for making leap years. It became known as the Gregorian calendar. This calendar is used almost all over the world today.



Julius Caesar,  
Roman ruler

JULIAN 1582		October					Gregorian 1582	
Sun	Mon	Tues	Wed	Thurs	Fri	Sat		
		1	2	3	4		15	16
17	18	19	20	21	22	23		
24	25	26	27	28	29	30		
31								

The first four days of October, 1582, followed the calendar created by Julius Caesar (Julian calendar). The new Gregorian calendar began the very next day, but it was October 15!

## Calendar Changes

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. The unit of time equal to a thousand years is a \_\_\_\_\_.  
 A century  
 B season  
 C millennium

2. Julius Caesar \_\_\_\_\_.  
 A lived in the 16th century  
 B was a ruler of ancient Rome  
 C thought winter should be in September

3. Would you like to live in a world without a calendar? Why or why not?  
 Give an example of what would happen.
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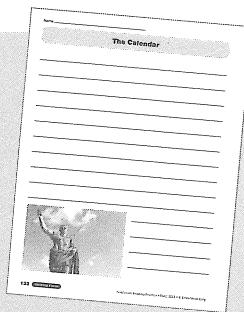
4. Imagine you could meet Julius Caesar. What would you be able to tell him about how his calendar worked?
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5. What would be a way to test the Gregorian calendar to see if it works better than Julius Caesar's calendar?
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### Write About the Topic

Use the Writing Form to write about what you read.

List four facts you know about calendar history.



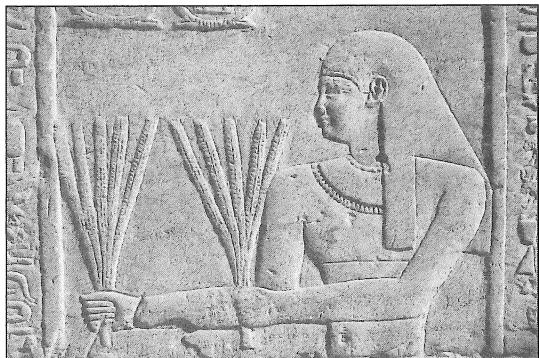
# Ancient Calendars

For millennia, ancient people watched the seasons, sun, moon, and stars to help them keep track of time passing. They watched the sun rise and set. That is a unit of time called a day. They saw the four seasons repeat. That is a unit of time called a year. Watching the seasons was important to people in Egypt because their valley flooded every year. The new year began in the middle of summer when the river started to rise. After the floods, the Egyptians planted crops in the rich soil left there by the floodwaters.

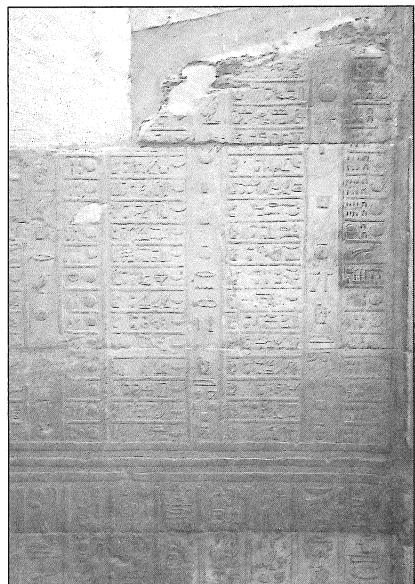
Other early calendars divided the year by cycles of the moon. People observed that the moon changed shape in a regular pattern. They knew that there were about 12 full moons from one spring to the next. They calculated that 29 or 30 days passed between each full moon. They divided the year into 12 lunar months. Twelve lunar months equaled about 354 days. That made each lunar calendar year 354 days long.

A lunar calendar did not work well. The sun, not the moon, controls the seasons. It takes about  $365 \frac{1}{4}$  days for the Earth to orbit the sun. The solar year—one that is based on the sun—was longer than the lunar year. Over time, the seasons no longer matched the lunar calendar. Every eight years, three months had to be added.

The Egyptians observed that every 365 days the same star (Sirius, the Dog Star) appeared near the rising sun. Soon after the Dog Star appeared, the Nile River would rise. So they began to use a solar calendar of 365 days. This calendar worked much better. Today's calendars are still based on a solar calendar of 365 days.



In ancient Egypt, summer floods brought rich soil for planting every year.



Ancient Egyptian calendar on a temple wall near the Nile River

## Ancient Calendars

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. A lunar calendar \_\_\_\_\_.

- (A) is based on the sun
- (B) is based on the moon
- (C) matches the seasons

2. A unit of time having four seasons is a \_\_\_\_\_.

- (A) millennium
- (B) day
- (C) year

3. What question does paragraph 3 answer?

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4. What fact shows how important the new year was to ancient Egyptians?

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5. Why did the people of ancient Egypt need a calendar? How did it help them?

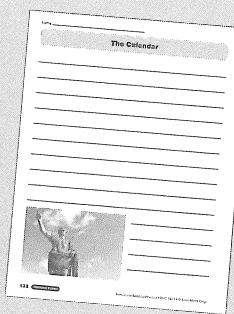
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### Write About the Topic

Use the Writing Form to write about what you read.

Imagine what would happen if we didn't have a calendar. What kinds of mix-ups would there be?



# Calendar History

Study a calendar. It looks simple and orderly. But a calendar is more of a mathematical puzzle than you might guess. The calendar we use today has gone through centuries of changes.

For millennia, people watched the seasons, sun, moon, and stars to help them keep track of time passing. Ancient people did not know that Earth orbits the sun about every 365 ¼ days. They tried to track the year by counting the full moons. Each year had 12 full moons. Twelve moons, or months, made one lunar year.

Calendars in Babylon used a lunar year. Twelve months added up to only 354 days. That made the lunar year 11 days too short. As years went by, the months and the seasons no longer matched up.

People in ancient Egypt came up with a solar calendar of 365 days. They observed that Sirius, the Dog Star, appeared near the rising sun every 365 days. Soon after that, the Nile River would rise. They looked forward to the flooding of the Nile, because it brought good things. The rich soil left by floodwaters was good for planting.

The ancient Romans used a calendar of 10 months. Because a Roman year was only 304 days, it seemed to always be out of step with the seasons. Holidays showed up at the wrong time of year.

A Roman ruler named Julius Caesar ordered a change. He created a calendar with 12 months, each 30 or 31 days long. He added an extra day every four years to keep things on track. This calendar was used for more than a millennium. But by the end of the 16th century, it was ten days out of step.

Pope Gregory XIII created today's calendar in 1582. He set new mathematical rules for keeping the calendar in step with the seasons. Today, the Gregorian calendar is used almost everywhere in the world.



We still use the calendar created by Pope Gregory XIII today.