

Name _____ Date _____

LEAP YEAR

As February 29, 2008 approaches, some people may notice something unusual about the date. Last year, there was no February 29th. In fact, there has not been a February 29th since 2004. Why does February 29th occur only once in four years? To understand this confusing arrangement, it is necessary to understand the calendar that is currently used in the United States.

Nearly all modern societies use some kind of calendar to decide on the dates and times of everything, from religious holidays to business meetings. The kind of calendar used determines what makes up a week, a month, or a year. Some societies use lunar calendars, which are based on the revolution of the moon around Earth, and others use solar calendars, which are based on the revolution of Earth around the sun. The United States, like much of the rest of the world, uses a solar calendar.

The solar calendar used by most of the world today is known as the Gregorian calendar. Named after Pope Gregory XIII, who introduced it in 1582, this modern calendar is the end result of hundreds of years of fine-tuning. It was developed from the Julian calendar, which was created in 46 BC by Julius Caesar.

The Julian calendar was also a solar calendar, based on the time it takes for Earth to travel one complete loop around the sun. In Julius Caesar's time, although astronomers believed that the sun revolved around Earth, they still managed to make fairly accurate measurements of the length of a complete cycle. A solar year, they calculated, was about 365.25 days long.

Julius Caesar, deciding that it would be difficult to add $\frac{1}{4}$ of a day onto each year, ordered one extra day to be added every four years to the month of February, creating what would be called "leap" years. This calendar was used by the western world for over a thousand years.

Unfortunately, there was a problem with the Julian calendar. When Julius Caesar ordered a leap year every four years, he was putting in too many extra days. A solar year is not 365.25 days long, but in fact 365.24219 days. The difference between the actual length of the solar year and the approximated value is very small, but over several hundred years it began to add up. By the 1500s, spring holidays were starting to happen in the summer.

In 1582, Pope Gregory XIII came up with an idea of how to fix the problem. He realized that there were too many leap years in the Julian calendar, so he reorganized it into a more complicated system. In the new calendar, there is still a leap year almost every four years, but there is also a new rule. If the year ends in 00, it is only a leap year if the year's number can be divided by 400. For this reason, 1800 and 1900 were not leap years, but 2000 was.

The new calendar was so accurate that over the next several hundred years, it was adopted by almost every country in the world. Over 400 years after its introduction, the Gregorian calendar is currently in use world-wide.



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ANSWER THE QUESTIONS ABOUT *LEAP YEAR*

1. Which is the name of the calendar currently used in the United States?
 - a. the Gregorian calendar
 - b. the Julian calendar
 - c. the Lunar calendar
 - d. the Pope's calendar
2. How many days are there in a solar year?
 - a. 365
 - b. 365.25
 - c. 366
 - d. 365.24219
3. When were leap years first used?
 - a. 46 BC
 - b. 1592
 - c. 1700
 - d. 1582
4. Which best describes the kind of calendar used today in the United States?
 - a. a solar calendar, based on the revolution of the moon around Earth
 - b. a lunar calendar, based on the revolution of the moon around Earth
 - c. a solar calendar, based on the revolution of Earth around the sun
 - d. a lunar calendar, based on the revolution of the moon around the sun
5. By our modern calendar, which of the following years WILL be a leap year?
 - a. 2100
 - b. 2500
 - c. 2200
 - d. 2800
6. Which of the following best describes the reason for creating leap years?
 - a. The Earth revolves around the sun.
 - b. The solar year does not divide into an even number of days, and it would be difficult to add $\frac{1}{4}$ of a day onto each year.
 - c. Astronomers calculated the approximate length of a solar year.
 - d. Pope Gregory XIII saw the problem with the Julian calendar.
7. Which statement best describes the problem with the Julian calendar?
 - a. Pope Gregory XIII did not like the Julian calendar.
 - b. The actual solar year was slightly shorter than the year calculated for the Julian calendar, so there were too many leap years.
 - c. The actual solar year was slightly longer than the year calculated for the Julian calendar, so there were not enough leap years.
 - d. The Julian calendar did not have leap years.



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LEAP YEAR WORD SEARCH

Find the words associated with leap year. Use the words in the text box for help.

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|----------|-----------|----------|----------|--------|
| CAESAR | GREGORIAN | SOLAR | LUNAR | DATES |
| CALENDAR | DAY | SUN | FEBRUARY | JULIAN |
| MOON | POPE | HOLIDAYS | YEAR | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q | U | P | D | E | A | W | R | O | T | A | T | I | O | N | S | F |
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| Y | E | A | R | P | U | D | S | U | N | A | U | R | I | I | S | B |
| A | G | W | M | O | A | H | M | O | F | I | L | D | A | T | E | S |
| U | O | X | O | P | A | Y | N | O | G | R | I | O | B | P | D | A |
| L | R | E | R | E | A | F | E | B | R | U | A | R | Y | T | Y | M |
| R | I | A | B | H | S | R | D | T | L | T | N | P | H | R | O | T |
| E | A | R | Y | S | O | P | R | R | H | O | L | I | D | A | Y | S |
| O | N | A | I | O | L | U | N | A | R | P | Y | R | I | P | V | O |
| I | K | A | X | M | A | E | P | N | C | Q | F | I | E | E | J | J |
| A | T | M | O | Y | R | C | A | E | S | A | R | Y | A | A | E | K |
| C | A | L | E | N | D | A | R | D | N | W | M | T | C | B | R | L |
| S | D | I | E | E | V | W | V | M | O | O | N | Z | H | F | R | P |



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ANSWERS TO LEAP YEAR

1. a
2. d
3. a
4. c
5. d
6. b
7. b

Word Search Answers

Q U P D E A W R O T A T I O N S F
P G R A I L L U O Y J L Z S O B E
G R Z Y E S B C W U R J N N E E O
Y E A R P U D S U N A U R I I S B
A G W M O A H M O F I L D A T E S
U O X O P A Y N O G R I O B P D A
L R E R E A F E B R U A R Y T Y M
R I A B H S R D T L T N P H R O T
E A R Y S O P R R H O L I D A Y S
O N A I O L U N A R P Y R I P V O
I K A X M A E P N C Q F I E E J J
A T M O Y R C A E S A R Y A A E K
C A L E N D A R D N W M T C B R L
S D I E E V W V M O O N Z H F R P

