



Leap Year Celebration!

Every four years we get the chance to celebrate Leap Year, when our calendar has a whole extra day! Even though Leap Day is February 29, you can take the rest of the year to learn more about this astronomical phenomenon. Complete the four activities in this guide to earn your Leap Year fun patch.



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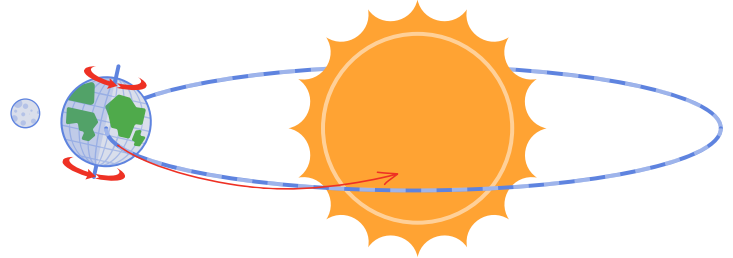
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Activity 1: Planetary Roleplay

Under most circumstances, Leap Year occurs every four years when our calendar gets a whole extra day on February 29. This “Leap Day” serves to keep our calendar and our seasons aligned over very long timescales (think hundreds and thousands of years!) In order to understand Leap Day, you need to understand a little bit of astronomy.

First, you need to know how the Earth works in space. Planet Earth spins like a top on its axis while it travels in orbit around the sun. The spinning is what gives us days, and the traveling is what gives us seasons.

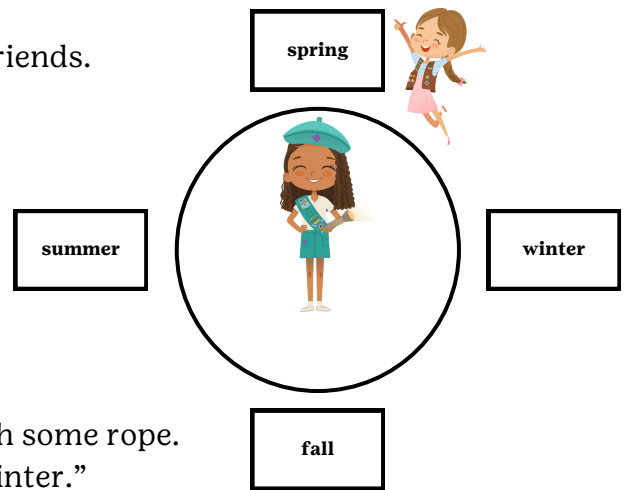


We think of one year as being 365 days, and one day as being 24 hours. However, astronomers (scientists who study outer space) have figured out that one day—the time it takes for Earth to make one full spin—is actually a little less than 24 hours, about 23 hours and 59 minutes. While that doesn’t seem like a lot, that missing minute added up over the course of 4 years equals a whole extra day! That’s when we need to add February 29 to the calendar.

To understand this further, try roleplaying with a few friends.

You will need:

- 1 Hula hoop or a rope to make a circle
- 4 pieces of paper (scrap paper is fine)
- 1 marker
- 1 flashlight or a device with a flashlight feature
- At least 2 friends



Instructions:

1. Lay a Hula-hoop on the ground or make a circle with some rope.
2. Label the papers “spring”, “summer,” “fall,” and “winter.”
Lay these in order around the circle, evenly spaced, as shown in the example above.
3. Have one friend stand in the middle of the circle holding the flashlight. This friend represents the sun. Have another friend stand on the outside of the circle to represent the Earth. The friends should face each other.
4. Have Sun Friend turn the flashlight on and hold it so it is pointing at Earth Friend’s chest or stomach (not their face!) When Earth Friend is facing the light, this represents daytime. When their back is to the light, this represents night.
5. Earth Friend should slowly walk around the circle while carefully spinning. As they walk, Sun Friend should continue to shine their light on Earth Friend. Earth Friend’s spinning represents the days, and their movement around the circle represents travelling through the seasons.
6. When Earth Friend is almost all the way around the circle, they should “leap” back to their original starting point, just like Leap Day!

Activity 2: To Leap or Not to Leap

Figure out whether each year below was a Leap Year or not. (You might need a calculator to help.) Write “Leap!” in the space next to the year if that year was a Leap Year. Write “not” or leave it blank if the year was not a Leap Year.

Remember, a Leap Year must be:

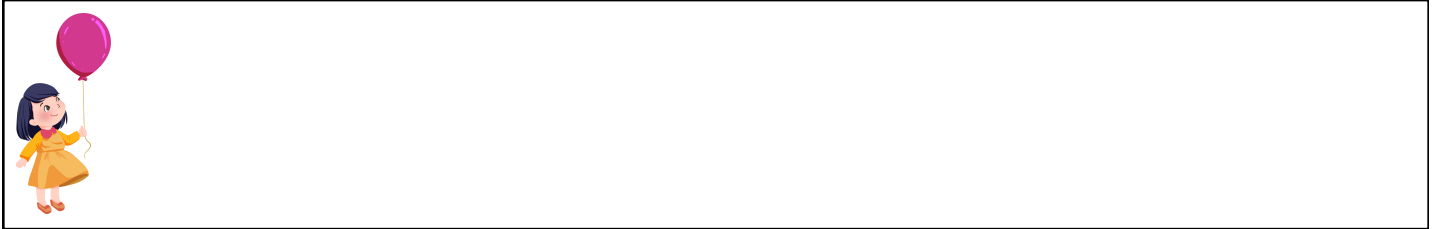
- An even-numbered year
- A number evenly divisible by 4
- A number also evenly divisible by 400 if it ends in “00” (like 1900)

- _____ **1425** (Joan of Arc receives her first divine vision instructing her to lead the French to victory over the English in the Hundred Years War.)
- _____ **1500** (Catherine of Aragon marries Prince Arthur of England, but he dies 5 months later so she weds his younger brother, Henry 8, instead.)
- _____ **1558** (Elizabeth I is crowned Queen of England.)
- _____ **1608** (Catalina de Erauso, at the age of 16, flees a Spanish convent where she is a nun, disguises herself as a man, and joins the Spanish colonial army in South America.)
- _____ **1620** (The Mayflower lands in Massachusetts with the Pilgrims.)
- _____ **1692** (The Salem witch trials begin in colonial Massachusetts leading to the death of 14 woman accused of witchcraft.)
- _____ **1700** (The House of Medici in Florence has the first-ever documented existence of a piano.)
- _____ **1762** (The reign of Catherine the Great of Russia begins.)
- _____ **1777** (Sybil Luddington allegedly rides 40 miles through the night to warn Patriot troops of the British arrival while Paul Revere only rides 20 miles on the same night.)
- _____ **1850** (Harriet Tubman leads her first rescue mission on the Underground Railroad.)
- _____ **1860** (Juliette Gordon Low is born in Savannah, Georgia.)
- _____ **1898** (Marie Curie isolates polonium which helps earn her a Nobel Prize in Physics.)
- _____ **1912** (Girl Scouts is founded.)
- _____ **1932** (Amelia Earhart becomes the first woman to make a nonstop solo flight across the Atlantic.)
- _____ **1955** (Rosa Parks refuses to give up her seat on a bus to a white patron sparking the Birmingham Bus Boycott and the Civil Rights Movement.)
- _____ **1983** (Sally Ride becomes the first US woman in space.)
- _____ **2000** (The US leads the medal count at the Summer Olympics with 93 medals, 38 won by women or women's teams.)
- _____ **2014** (Malala Yousafzai is awarded the Nobel Peace Prize for her work in promoting women’s education in the Middle East.)
- _____ **2020** (The COVID-19 pandemic changes life as we know it on a global scale.)

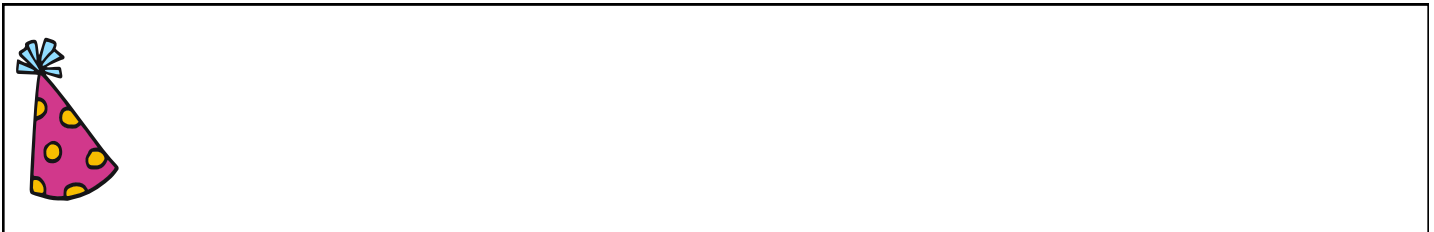
Activity 3: Leaper Party!

People born on February 29 are sometimes known as “leapers.” Because February 29 only occurs every 4 years—and sometimes only every 8 years!—leapers are 4 years old before they can celebrate their birthday on their actual date of birth! For each birthday below, figure out how old the leaper is (the first one is done for you,) and then think of some fun party activities they could do! Write down or draw pictures of your ideas in the boxes below.

1st birthday: 4 years old



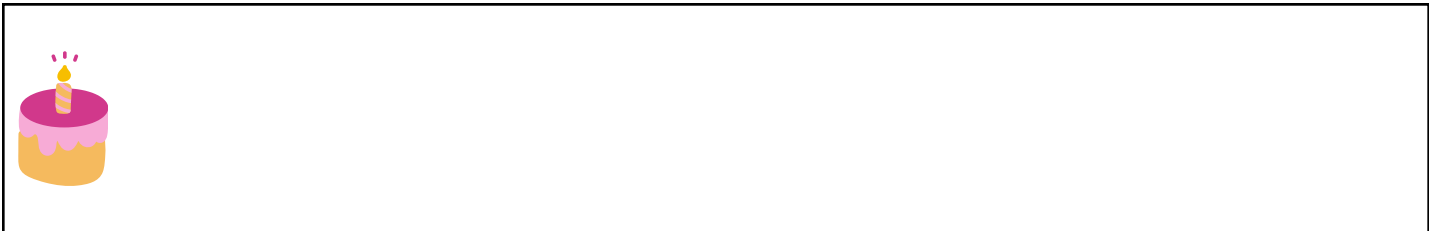
2nd birthday: ___ years old



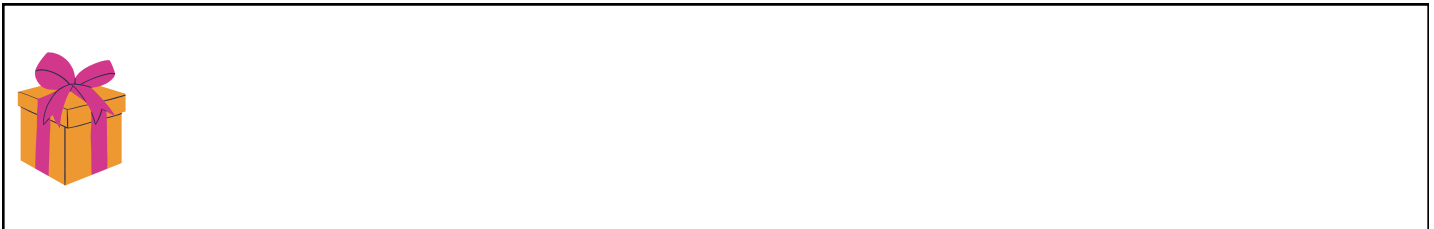
3rd birthday: ___ years old



4th birthday: ___ years old



5th birthday: ___ years old



Activity 4: Letters from the Future

If we didn't observe Leap Year as we do, the calendar would "drift" out of sync with the seasons by about one month every hundred years. This means that after 300 years, February would feel more like May! Use the calendar below to figure out how the other months would "drift" over 300 years. For example, if February becomes like May, then March would be like June, April would be like July, and so on.

Then, imagine you live in the year 2324. Leap Year hasn't been observed in three hundred years. You know that holidays like Christmas and Hanukkah used to be celebrated in the middle of winter, but for you they've always been in spring. July 4th marks the beginning of autumn, and Halloween usually has you trick-or-treating in the snow. How else has life changed? What other differences are there with events like holidays or solstices or birthdays? (In 2024, the "winter solstice" was in December and the "summer solstice" was in July, but when do these event occur for you?) Write a short paragraph or draw a picture describing this "new normal" of time!

