

The Year of the Earth Pig



The Lunar New Year will begin this year on Tuesday, February 5th. Last year the New Year's date was February 16th. Why does it vary?

In most of East Asia today, the Gregorian calendar (January, February, etc.) is used for day-to-day activities, but the Chinese calendar is used for marking traditional East Asian holidays like the Lunar New Year

The Chinese calendar is really cool since it aligns the phases of the Moon and Earth's rotation around the Sun. This kind of calendar is called a lunisolar calendar.

Lunar New Year celebrations include family gatherings, reunions, feasts, decorations, presents, parades, fire works and well wishes. The New Years celebration will continue for 15 days until the Lantern Festival on February 19th. The Lunar New Year is the longest and most important celebration in the Chinese calendar.

The calendar is really complex to understand but the naming of each year is simpler. This year is going to be the year of the Earth Pig. Let's try to figure out how the years are named.

The years of the Chinese calendar are based on two forms of counting: a cycle of 10 Heavenly Stems and a cycle of 12 Earthly Branches. Each year is named by a pair ... one stem and one branch called a Stem-Branch (干支 *gānzhī*). The Heavenly Stems are associated with Yin/Yang and the Five Elements. Each Earthly Branch is associated with an animal.

There are 10 Heavenly Stems, each of 5 twice first as Yang and then as Yin:

- Wood, Yang
- Wood, Yin
- Fire, Yang
- Fire, Yin
- Earth, Yang
- Earth, Yin
- Metal, Yang
- Metal, Yin
- Water, Yang
- Water, Yin

And 12 Earthly Branches:

- Rat
- Ox
- Tiger
- Rabbit
- Dragon
- Snake
- Horse
- Sheep/Goat
- Monkey
- Rooster
- Dog
- Pig

Years proceed with a new Heavenly Stem every two years and a new Earthly Branch every year. That means that it takes 10 years for the Heavenly Stems to repeat and 12 years for the Earthly Branches to repeat. On the next page is a chart that shows the progression of years in the Chinese calendar.

1. Please continue my chart to get the hang of this naming progression.

iǎzǐ (甲子) Year in the cycle	Stem/branch	Year of the...	Gregorian	New Year's Day (chūnjié, 春節)
27	7/3	Metal Tiger	2010	February 14
28	8/4	Metal Rabbit	2011	February 3
29	9/5	Water Dragon	2012	January 23
30	10/6	Water Snake	2013	February 10
31	1/7	Wood Horse	2014	January 31
32	2/8	Wood Goat	2015	February 19
33	3/9	Fire Monkey	2016	February 8
34	4/10	Fire Rooster	2017	January 28
35	5/11	Earth Dog	2018	February 16
36	6/12	Earth Pig	2019	February 5
37				January 25
38				February 12
39				February 1
40				January 22
41				February 10

I wonder how often a particular year name will repeat. I'll do a couple of experiments using numbers smaller than 10 and 12.

- If you had a choice of two symbols for the first part of a year designation (let's use π and ϕ) and a choice of 3 animals for the second year designation (let's use hamster, cat, and goldfish), how many years would it take before the cycle of year names repeats? Show your work.
- Do you see a technique for figuring out how often a naming will repeat? Write your theory here.
- If you had 2 symbols for the first designation that repeated every other year (a rotation of 4) and 6 symbols for the second designation that repeat every year, can you guess how often the year name would repeat?
- List the possible pairs of 2 symbols that repeat every other year (a rotation of 4) and 6 symbols that repeat every year (a rotation of 6) below. Did your technique of predicting the number of possible names (from problem # 3) work?
- Try to explain the process that you see happening when you try to find out how often a year designation repeats.

7. Now let's go back to the Chinese calendar. How often do you think a particular year name (like Earth Pig) will repeat?
8. Explain why you think that this will be so.



Happy New Year!

Sources:

http://en.wikipedia.org/wiki/Chinese_calendar
http://en.wikipedia.org/wiki/Chinese_New_Year
<http://www.chinapage.com/newyear.html>

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