



# **BAD** **ASTRONOMY**

**MYTHS AND MISCONCEPTIONS**



## **SCIENCE ACTIVITIES**

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## Discovering Bad Astronomy!

The words at the bottom of this page are words you will hear about in the Planetarium show ***Bad Astronomy***. Look for these words across, down, and diagonally. Some words may even be spelled backwards.

G	G	I	T	H	R	U	S	T	E	R	S	O	P	B
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COMET  
HUBBLE  
BAD ASTRONOMER  
ASTRONOMY  
UFO  
ALIEN  
SPACECRAFT

VENUS  
JUPITER  
SATURN  
AUTOKINETIC  
EFFECT  
LIGHT-YEAR  
MOON

DUST  
ROCK  
APOLLO  
VAN ALLEN BELTS  
COMPUTER  
SOUND IN SPACE  
BANKING

THRUSTERS  
LASER  
ASTEROIDS  
ASTROLOGY  
ZODIAC  
HOROSCOPE  
GRAVITY

# Testing Astrology

## Birth Dates of the United States Presidents













1. George Washington:	February 22, 1732
2. John Adams:	October 30, 1735
3. Thomas Jefferson:	April 13, 1743
4. James Madison:	March 16, 1751
5. James Monroe:	April 28, 1758
6. John Q. Adams:	July 11, 1767
7. Andrew Jackson:	March 15, 1767
8. Martin Van Buren:	December 5, 1782
9. William Harrison:	February 9, 1773
10. John Tyler:	March 29, 1790
11. James Polk:	November 2, 1795
12. Zachary Taylor:	November 24, 1784
13. Millard Fillmore:	January 7, 1800
14. Franklin Pierce:	November 23, 1804
15. James Buchanan:	April 23, 1791
16. Abraham Lincoln:	February 12, 1809
17. Andrew Johnson:	December 29, 1808
18. Ulysses Grant:	April 27, 1822
19. Rutherford Hayes:	October 4, 1822
20. James Garfield:	November 19, 1831
21. Chester Arthur:	October 5, 1830
22. Grover Cleveland:	March 18, 1837
23. Benjamin Harrison:	August 20, 1833
24. William McKinley:	January 29, 1843
25. Teddy Roosevelt:	October 27, 1858
26. William Taft:	September 15, 1857
27. Woodrow Wilson:	December 28, 1856
28. Warren Harding:	November 2, 1865
29. Calvin Coolidge:	July 4, 1872
30. Herbert Hoover:	August 10, 1874
31. Franklin Roosevelt:	January 30, 1882
32. Harry Truman:	May 8, 1884
33. Dwight Eisenhower:	October 14, 1890
34. John Kennedy:	May 29, 1917
35. Lyndon Johnson:	August 27, 1908
36. Richard Nixon:	January 9, 1913
37. Gerald Ford:	July 14, 1913
38. Jimmy Carter:	October 1, 1924
39. Ronald Reagan:	February 6, 1911
40. George H. W. Bush:	June 12, 1924
41. William J. Clinton:	August 19, 1946
42. George W. Bush:	July 6, 1946



# Testing Astrology

## United States Presidents

Using the U. S. Presidents' page of birth dates, place each president's name under the correct Zodiac sign in the chart. Complete the Presidents' Astrology questions and analysis page after you complete this chart.

<p><b>ARIES 3/21 - 4/20</b></p> 	<p><b>TAURUS 4/21 - 5/21</b></p> 	<p><b>GEMINI 5/22 - 6/21</b></p> 
<p><b>CANCER 6/22 - 7/22</b></p> 	<p><b>LEO 7/23 - 8/21</b></p> 	<p><b>VIRGO 8/22 - 9/23</b></p> 
<p><b>LIBRA 9/24 - 10/23</b></p> 	<p><b>SCORPIO 10/24 - 11/22</b></p> 	<p><b>SAGITTARIUS 11/23 - 12/22</b></p> 
<p><b>CAPRICORN 12/23 - 1/20</b></p> 	<p><b>AQUARIUS 1/21 - 2/19</b></p> 	<p><b>PISCES 2/20 - 3/20</b></p> 



## President Astrology Activity: Questions and Analysis

If astrology works, people with similar jobs, such as the U.S. presidents, should have similar star signs. Answer these questions using your completed star sign chart to find out if this is true.

1. What is the difference between astronomy and astrology?

2. How many Presidents' birthdays fall under each Zodiac sign?

Aries _____	Cancer _____	Libra _____	Capricorn _____
Taurus _____	Leo _____	Scorpio _____	Aquarius _____
Gemini _____	Virgo _____	Sagittarius _____	Pisces _____

3. What sign has the largest number of Presidents? How many?

4. What sign has the smallest number of Presidents? How many?

5. Looking at your results, do you see any pattern?













6. Would you say the birth dates of the Presidents are strongly clustered in one or a few signs?  
What does this tell you about astrology?



# Testing Astrology

## YOUR CLASSMATES

List your classmates under their Zodiac sign.  
Are they all clumped together or scattered across the signs of the zodiac?

<b>ARIES</b> 3/21 - 4/20 	<b>TAURUS</b> 4/21 - 5/21 	<b>GEMINI</b> 5/22 - 6/21 
<b>CANCER</b> 6/22 - 7/22 	<b>LEO</b> 7/23 - 8/21 	<b>VIRGO</b> 8/22 - 9/23 
<b>LIBRA</b> 9/24 - 10/23 	<b>SCORPIO</b> 10/24 - 11/22 	<b>SAGITTARIUS</b> 11/23 - 12/22 
<b>CAPRICORN</b> 12/23 - 1/20 	<b>AQUARIUS</b> 1/21 - 2/19 	<b>PISCES</b> 2/20 - 3/20 



# The Moon Illusion

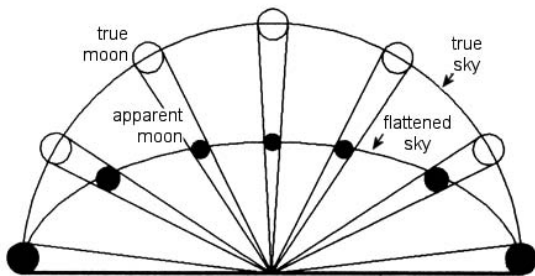


Visit <http://aa.usno.navy.mil> to find the date and time when the next full moon will rise.

Step outside at sunset on the date of the full moon and look east. You'll see a giant moon rising in the east. It looks like Earth's moon, round and cratered. The Man in the Moon is in his usual place, but something's wrong. This full moon is strangely inflated. It's huge!

You've just experienced the Moon Illusion.

When you look at the moon, rays of moonlight converge and form an image about 0.15 mm wide in the back of your eye. High moons and low moons make the same sized spot. So, why does your brain think one is bigger than the other?



Maybe it's the shape of the sky. Humans perceive the sky as a flattened dome, with the zenith nearby and the horizon far away. It makes sense: Birds flying overhead are closer than birds on the horizon. When the moon is near the horizon, your brain, trained by watching birds, miscalculates the moon's true distance and size. Another theory states foreground objects trick your brain into thinking the moon is bigger than it really is.

## Moon Illusion Activity

- 1.) Look at the moon close to the horizon with your eyes only.
- 2.) Now look at the moon through a narrow opening of some kind, such as a plastic straw. Note the size.

Look at the moon again three hours later. You will notice the moon is located higher in the sky and looks smaller. Look at it with your eyes, then through the straw. Does the straw make the optical illusion vanish?



## Web Site Resources

Check out these web sites for additional information related to this planetarium show.

### **[www.badastronomy.com](http://www.badastronomy.com)**

The Bad Astronomer promotes critical thinking and the scientific method.

### **[www.astrosociety.org/education/resources/pseudobib.html](http://www.astrosociety.org/education/resources/pseudobib.html)**

Astronomical Society of the Pacific's "bad astronomy" information page

### **[facstaff.uww.edu/mccreadd](http://facstaff.uww.edu/mccreadd)**

Explore why the moon seems bigger when you see it close to the horizon.

### **[www.scienceblogs.com](http://www.scienceblogs.com)**

A community of 40 selected science bloggers, set up as an experiment in scientific communication.

### **[hoaxbusters.ciac.org](http://hoaxbusters.ciac.org)**

A site discussing hoaxes found on the Internet.

### **[www.snopes.com](http://www.snopes.com)**

Busting rumors about urban myths.

### **[dsc.discovery.com/fansites/mythbusters/mythbusters.html](http://dsc.discovery.com/fansites/mythbusters/mythbusters.html)**

Explore the antics of The Discover Channel's Mythbusters show.

### **[www.unexplainedstuff.com](http://www.unexplainedstuff.com)**

An encyclopedia of the unusual and unexplained.

### **[www.randi.org](http://www.randi.org)**

The James Randi Educational Foundation promotes critical thinking by reaching out to the public and media with reliable information about paranormal and supernatural ideas widespread in our society today.

### **[www.skeptic.com](http://www.skeptic.com)**

The Skeptics Society is a scientific and educational organization of scholars, scientists, historians, and teachers interested in promoting science.

### **[richarddawkinsfoundation.org/foundation](http://richarddawkinsfoundation.org/foundation)**

Oxford University's Professor Richard Dawkins Foundation for Reason and Science serves as an oasis of clear and critical thinking.

### **[www.richardwiseman.com](http://www.richardwiseman.com)**

Professor Wiseman holds Britain's only chair in the Public Understanding of Psychology at the University of Hertfordshire, and has gained an international reputation for research into unusual areas of psychology, including deception, luck and the paranormal.

### **[www.theskepticsguide.org](http://www.theskepticsguide.org)**

The skeptics guide to the universe.



# BAD ASTRONOMY

MYTHS AND MISCONCEPTIONS

## ANSWER KEY

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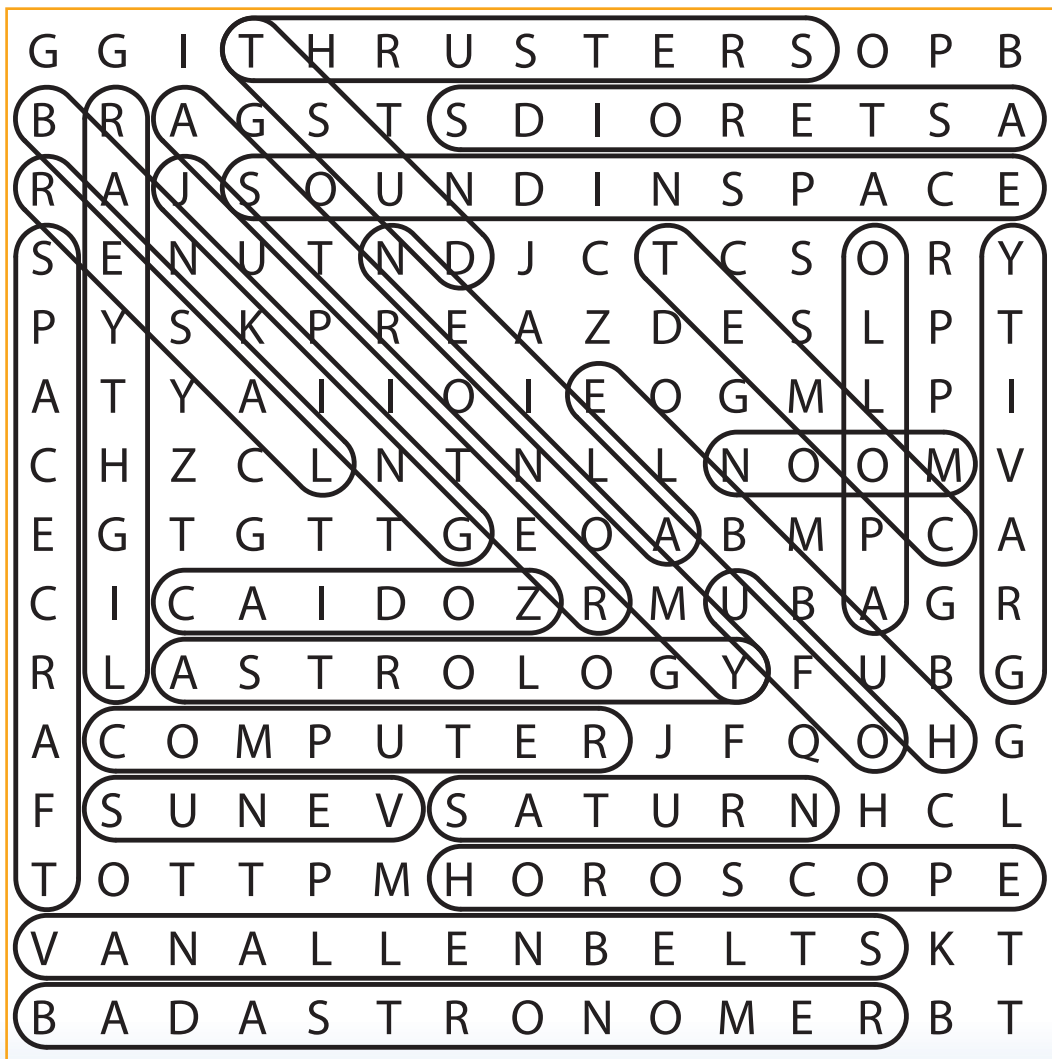


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MOON


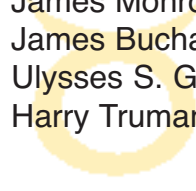
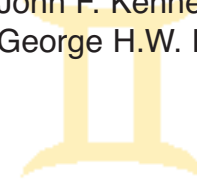
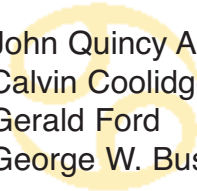
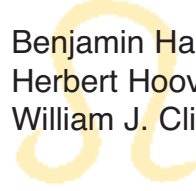
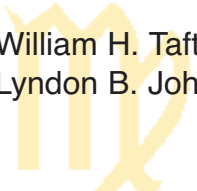
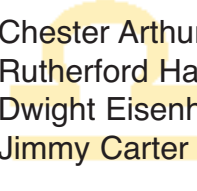
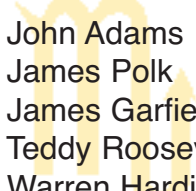
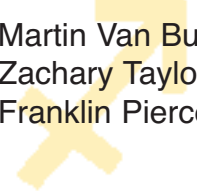
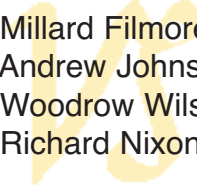
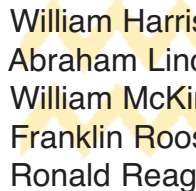
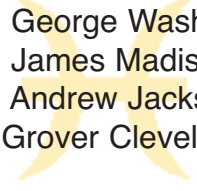
DUST  
ROCK  
APOLLO  
VAN ALLEN BELTS  
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## United States Presidents

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# President Astrology Activity: Questions and Analysis

If astrology works, people with similar jobs, such as the U.S. presidents, should have similar star signs. Answer these questions using your completed star sign chart to find out if this is true.

## 1. What is the difference between astronomy and astrology?

Astronomy is a science concerned with the observation and understanding of the processes that formed the observable universe, are in action today, and what effects these processes will have on the evolution of the universe.

Astrology is the pseudoscience (false science) that claims to predict the future of individuals by the location of the Sun, Moon and planets in the zodiac at the birth of that individual. This is the most popular form of astrology, known as natal or sun sign astrology.

## 2. How many Presidents' birthdays fall under each Zodiac sign?

Aries 2	Cancer 4	Libra 4	Capricorn 4
Taurus 4	Leo 3	Scorpio 5	Aquarius 5
Gemini 2	Virgo 2	Sagittarius 3	Pisces 4

## 3. What sign has the largest number of Presidents? How many?

Tied. Scorpio and Aquarius at 5

## 4. What sign has the smallest number of Presidents? How many?

Tied. Aries, Virgo and Gemini at 2

## 5. Looking at your results, do you see any pattern?

No pattern exists. Presidents are scattered across all 12 zodiac signs

## 6. Would you say the birth dates of the Presidents are strongly clustered in one or a few signs? What does this tell you about astrology?

No. Birth dates of the Presidents are scattered across all 12 signs.  
Astrology does not work.

