

Activities About Astrology

Activity K2

Grade Level: 7–12



Source: This activity was written by Andrew Fraknoi, Astronomical Society of the Pacific, 390 Ashton Avenue, San Francisco, CA 94112. <http://www.astrosociety.org> Copyright ©1993, 2010 by the Astronomical Society of the Pacific. (The activity incorporates suggestions and ideas by Diane Almgren, Daniel Helm, and Dennis Schatz.)

What’s This Activity About?

These activities help students to understand the difference between science and pseudo-science by investigating some of astrology’s claims. Letting students have a good discussion after working with these activities can be very effective. We encourage you to read “Your Astrology Defense Kit,” found on *The Universe at Your Fingertips* disk, before leading these activities.

What Will Students Do?

Students test the validity of astrology by charting birth-dates of U.S. presidents, and by comparing horoscopes in different newspapers. Finally, students attempt to identify their own sign from an unidentified list of daily predictions.

Tips and Suggestions

- Some of the activities need preparation, such as buying a variety of newspapers. Be sure to check the instructions in advance of doing the activity.
- To expand on Activity 1, you could make a table of birthdays and sun-signs for other famous people like U.S. senators, world leaders, or award-winning actors, who might be expected to have common personality characteristics.
- The final activity, where students try to identify their own sign from an unidentified group of signs, works especially well with larger groups of students. Perhaps you can get two or more classes together to increase the number of participants.
- For more resources for understanding and testing astrology, see the guide “Responding to Claims of Astronomical Pseudoscience” (5.12) on *The Universe at Your Fingertips* disk.

What Will Students Learn?

Concepts

- Astrology’s basic ideas
- Testing a scientific hypothesis

Inquiry Skills

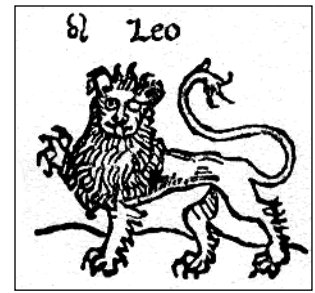
- Predicting
- Inferring
- Reasoning
- Recognizing bias
- Experimenting

Big Ideas

- Big Ideas
- Diversity and Unity
- Science versus pseudoscience

Activities About Astrology

by Andrew Fraknoi
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Introduction

These activities help students to understand the difference between science and pseudoscience by investigating some of astrology's claims. Letting students have a good discussion around these activities can be very effective, since the ideas of astrology can be both appealing and controversial in the eyes of your students. We encourage you to read "Your Astrology Defense Kit" on *The Universe at Your Fingertips* disk before doing these activities, but if you want to distribute it to students, we suggest you wait until they have completed the activities so as not to prejudice their outlook.

Students can test the validity of astrology with three activities:

1. Charting birthdates of U.S. presidents
2. Comparing horoscopes in different newspapers
3. Attempting to identify their own sign from an unidentified list of daily predictions.

Activity Descriptions

Activity 1: Testing Astrology with the Birthdays of the Presidents

Astrologers will tell you that the Sun sign (which is the sign of the zodiac the Sun was in when a person was born) can't tell you everything about an individual's personality, but that is a crucial factor for the *occupation* a person chooses and a strong determinant of overall personality as it relates to one's job. This would not apply to a summer job a college student takes in a department store, but Sun sign is expected to be a factor in careers that are personality driven, such as a stage actor, police officer, or meditation teacher. As an example of how we can test such a hypothesis, students can examine the birthdates of the 43 men who have successfully run for the job of President of the United States.

After all, it takes a certain kind of personality to be President (outgoing, well-spoken, ambitious... students can make their own list). If personality and occupation are strongly affected by Sun sign, we should find that the birthdays of the Presidents are clustered in one (or a

few) signs. If Sun signs do not affect personality and occupation, the Presidents' birthdays should be randomly distributed among the zodiac signs.

Students will fill out a worksheet to determine the astrological signs of the Presidents and discuss their results. The bottom of the worksheet has the dates for the astrological signs. You will need to review the concept of random distribution before doing this activity. Ask them how many Presidents they expect to find under each sign if the birthdays of the 43 Presidents are randomly distributed among the 12 signs of the zodiac? Then have them figure out the answer, working together in small groups.

Answer: Since there are 43 Presidents, chance would classify (43 people divided among 12 signs = 3.6, rounded off to 4 people) into each of 12 random "bins." With only 43 data points, however, you might expect one or two fewer or one or two more Presidents in a given sign. This is just what students will find.

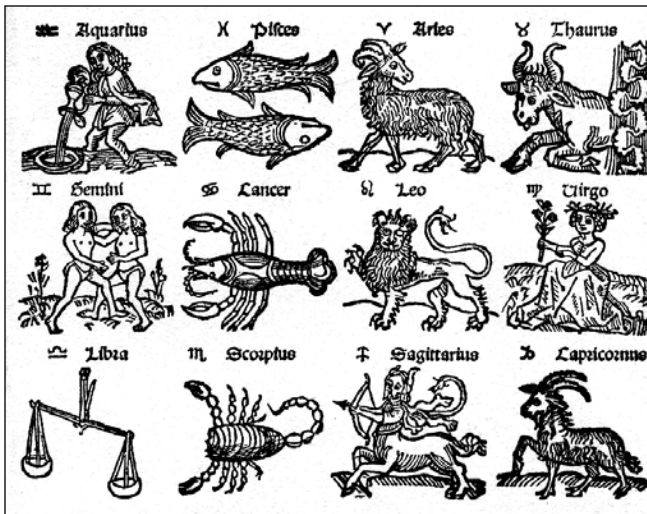
Students can answer the following specific questions:

1. Which sign has the largest number of Presidents? How many?
2. Which sign has the smallest number of Presidents? How many?
3. Looking at your results, do you see any pattern?
4. Would you say the birth dates of the Presidents are strongly clustered in one or a few signs?
5. What do your results say about whether sun sign has any effect on the likelihood that a person will be elected President of the U.S.?

Extending the Activity: Encourage students to discuss other ways to test this idea. What occupations are also personality-driven but have more than 43 people in them? (As discussed in *Your Astrology Defense Kit*, one group of statisticians tested all the men who re-enlisted in the Marine Corps — definitely a personality related career choice!)

Activity 2: Horoscopes from Different Astrologers

In this activity, students compare horoscopes in dif-



ferent newspapers from the same day. Ask students to bring in newspapers or buy them yourself. It's especially helpful to have newspapers from different cities in the same area. You can also copy newspapers from a local library, although using photocopies reduces the psychological impact of the activity somewhat. The more newspapers you have, the better the activity.

Cut the horoscope sections out of the papers and distribute each of them to a group of students. If possible, cut out the horoscopes in full view of the students for greater impact. Ask several students to read aloud the different horoscopes of one or more selected students from the various newspapers. Discuss the following questions:

1. How well do the predictions of different astrologer agree for that student's sign?
2. How specific are the newspaper statements?
3. In what ways could the statements apply to different people?

Have the students discuss some reasons why the predictions in astrology columns might be so general and vague. Remind them that in science, if you do the same experiment a number of times, you always get the same result. Why might horoscopes for the same signs disagree so much? If there is time, continue the discussion by bringing up some of the "embarrassing questions about astrology" in *Your Astrology Defense Kit*.

Activity 3: Mixed-up Horoscopes

In this activity, students try to find their own sign from a variety of unidentified signs in a horoscope column. Use

an astrology column from a recent newspaper (today, yesterday, or last weekend). It is best to use an out-of-town newspaper so students are not likely to have seen it. Cut out the horoscopes and remove the dates, signs and any telltale references to the sign, like "you're a real lion at times (for Leo)." Be sure to make a copy of the full column for yourself and put it aside. Mix up the order of the descriptions, and give each one a number from 1 to 12. Transfer these numbers to your copy for future reference.

Have each student write down his or her name and birthday on a piece of paper. Distribute copies of the sheet with all the mixed up and numbered (but otherwise unlabeled) horoscopes to the students and have them select the one description that best fits the day in question. (Be sure you remind them of the day the horoscopes apply.) Make sure students write down their selection.

Ask the students to predict how they think this experiment will turn out. To prevent sudden changes of answers, ask students to exchange papers at this point. Then put the signs and birthdates associated with each numbered paragraph on the board. Have the class count how many students picked their own sign among the 12 and how many did not.

If Sun sign astrology predicts one's day pretty well and everyone remembers the day in question clearly (the astrologer's hypothesis), students should in general be able to find their own paragraph. But if chance instead of the stars governs the composition of those descriptions (the skeptic's hypothesis), we would expect that only one out of 12 of the students would have selected the description for their own signs.

Warning: With small numbers of students in one class, it often happens by chance that there are a few more correct picks than one would expect by chance. With older students, this can give you a chance to discuss the need for large samples in good statistical studies. If students get intrigued by such extra hits, one way to check is to extend the test to other students or school staff.

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Worksheet: Birthdates of U.S. Presidents

NAME	BIRTHDAY	SIGN
1. George Washington	Feb 22, 1732	
2. John Adams	Oct 30, 1735	
3. Thomas Jefferson	Apr 13, 1743	
4. James Madison	Mar 16, 1751	
5. James Monroe	Apr 28, 1758	
6. John Q. Adams	Jul 11, 1767	
7. Andrew Jackson	Mar 15, 1767	
8. Martin Van Buren	Dec 5, 1782	
9. William Harrison	Feb 9, 1773	
10. John Tyler	Mar 29, 1790	
11. James Polk	Nov 2, 1795	
12. Zachary Taylor	Nov 24, 1784	
13. Millard Fillmore	Jan 7, 1800	
14. Franklin Pierce	Nov 23, 1804	
15. James Buchanan	Apr 23, 1791	
16. Abraham Lincoln	Feb 12, 1809	
17. Andrew Johnson	Dec 29, 1808	
18. Ulysses Grant	Apr 27, 1822	
19. Rutherford Hayes	Oct 4, 1822	
20. James Garfield	Nov 19, 1831	
21. Chester Arthur	Oct 5, 1830	
22. Grover Cleveland	Mar 18, 1837	

23. Benjamin Harrison	Aug 20, 1833	
24. William McKinley	Jan 29, 1843	
25. Teddy Roosevelt	Oct 27, 1858	
26. William Taft	Sep 15, 1857	
27. Woodrow Wilson	Dec 28, 1856	
28. Warren Harding	Nov 2, 1865	
29. Calvin Coolidge	Jul 4, 1872	
30. Herbert Hoover	Aug 10, 1874	
31. Franklin Roosevelt	Jan 30, 1882	
32. Harry Truman	May 8, 1884	
33. Dwight Eisenhower	Oct 14, 1890	
34. John Kennedy	May 29, 1917	
35. Lyndon Johnson	Aug 27, 1908	
36. Richard Nixon	Jan 9 1913	
37. Gerald Ford	Jul 14, 1913	
38. Jimmy Carter	Oct 1, 1924	
39. Ronald Regan	Feb 6, 1911	
40. George Bush	Jun 12, 1924	
41. William Clinton	Aug 19, 1946	
42. George W. Bush	Jul 6, 1946	
43. Barack Obama	Aug 4, 1961	

* Note: If you look it up, these numbers seem off by one. Barack Obama is the 44th President of the U.S. because Grover Cleveland served two terms, separated by Benjamin Harrison's term.

The Astrological System of Signs and Dates

Sign	Symbol	Dates
Aries	Ram	March 21–April 19
Taurus	Bull	April 20–May 20
Gemini	Twins	May 21–June 20
Cancer	Crab	June 21–July 22
Leo	Lion	July 23–August 22
Virgo	Virgin	August 23–September 22
Libra	Balance	September 23–October 22
Scorpio	Scorpion	October 23–November 21
Sagittarius	Archer	November 22–December 21
Capricorn	Goat	December 22–January 19
Aquarius	Water Bearer	January 20–February 18
Pisces	Fish	February 19–March 20