

1. Diagram 1 shows the Moon in its orbit at four positions labeled A, B, C, and D. Diagram 2 shows a phase of the Moon as viewed from New York State.

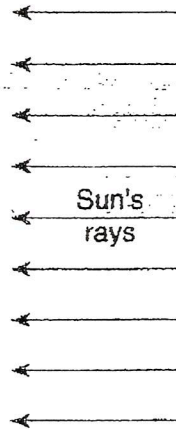
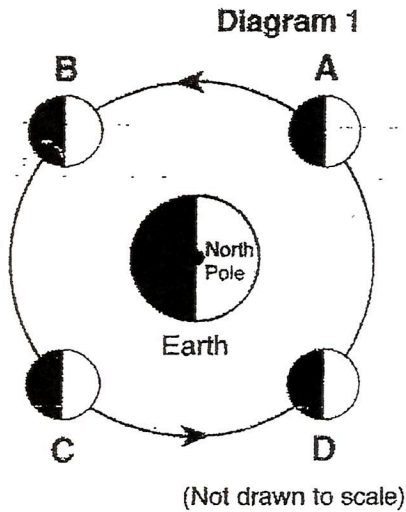
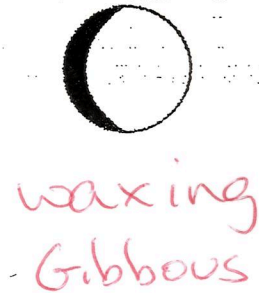


Diagram 2

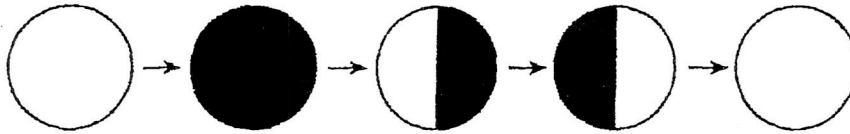


At which labeled Moon position would the phase of the Moon shown in diagram 2 be observed from New York State?

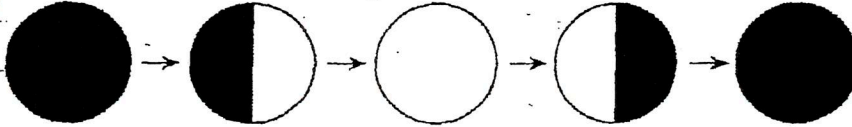
- 1) A 2) B 3) C 4) D
-
2. A cycle of Moon phases can be seen from Earth because the
- 1) Moon's distance from Earth changes at a predictable rate
 - 2) Moon's axis is tilted
 - 3) Moon spins on its axis
 - 4) Moon revolves around Earth
3. Which statement best explains why different phases of the Moon can be observed from the Earth?
- 1) The size of the Earth's shadow falling on the Moon changes.
 - 2) The Moon moves into different parts of the Earth's shadow.
 - 3) Differing amounts of the Moon's sunlit surface are seen because the Moon revolves around the Sun.
 - 4) Differing amounts of the Moon's sunlit surface are seen because the Moon revolves around the Earth.
4. The new-moon phase occurs when the Moon is positioned between the Earth and the Sun. However, these positions do not always cause an eclipse (blocking) of the Sun because the
- 1) Moon's orbit is tilted relative to the Earth's orbit
 - 2) new-moon phase is visible only at night
 - 3) night side of the Moon faces toward the Earth
 - 4) apparent diameter of the Moon is greatest during the new-moon phase
5. The diagram below shows a model of the Moon's orbit around Earth. Letters A, B, C, and D represent four positions in the Moon's orbit.
-
- (Not drawn to scale)
- What is the approximate length of time the Moon takes to travel from position A to position C?
- 1) 1 day
 - 2) 15 days
 - 3) 30 days
 - 4) 365 days
6. One complete cycle of the phases of the Moon takes approximately one
- 1) day
 - 2) week
 - 3) month
 - 4) year

7. Which diagram sequence correctly shows the order of Moon phases, as viewed from Earth, for a period of 1 month? [Note that some phases have been omitted.]

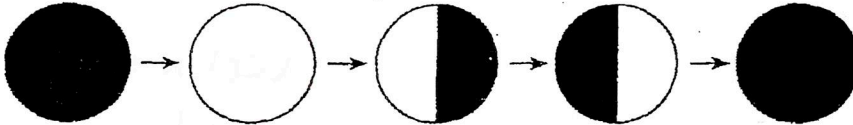
1)



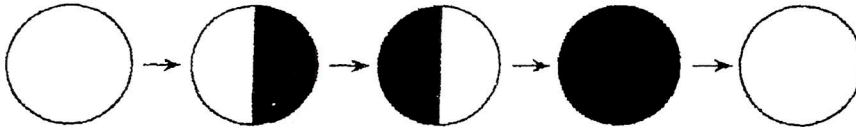
2)



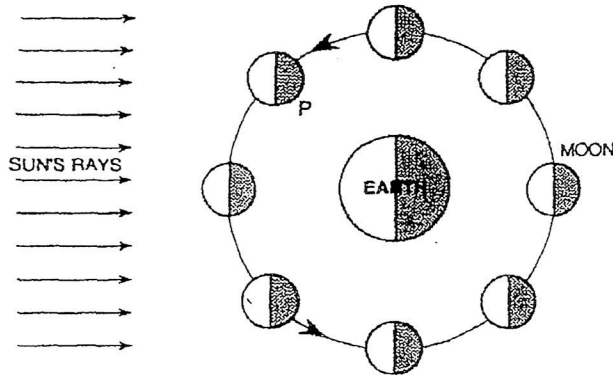
3)



4)



8. The diagram below shows the relative positions of the Earth, Moon, and Sun for a 1-month period.



Which diagram best represents the appearance of the Moon at position P when viewed from the Earth?

1)



3)



2)

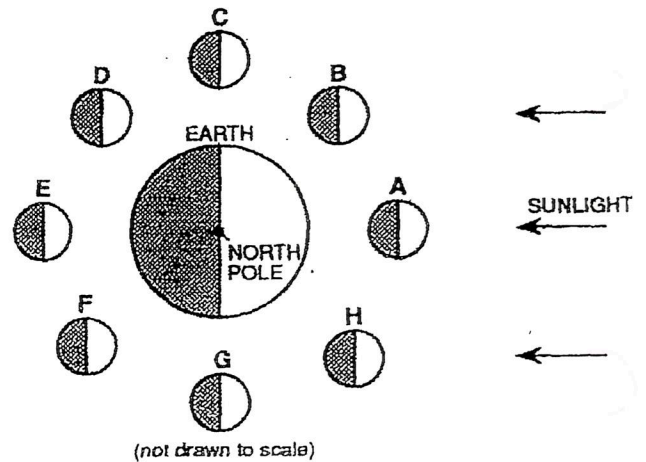


4)



waning crescent

9. The diagram below represents eight positions of the Moon as it revolves around the Earth.



When viewed from the Earth, which phase of the Moon will be seen when the Moon is at point E?

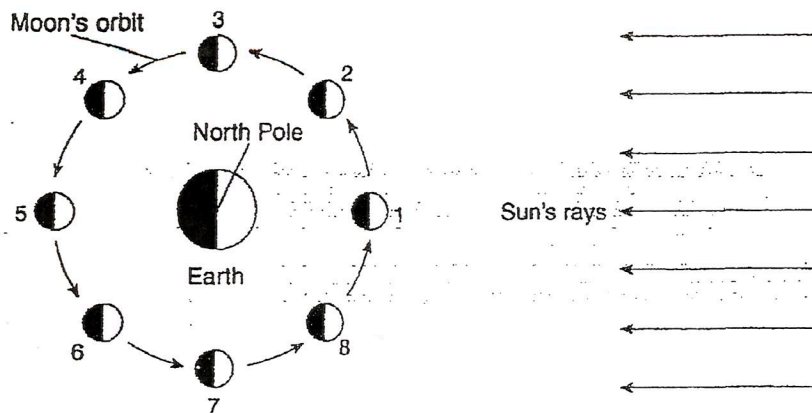
1) first quarter

3) new moon

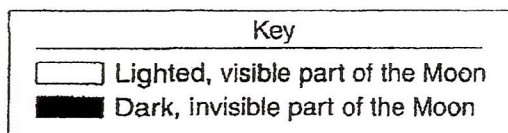
2) full moon

4) last quarter

Base your answers to questions 10 through 13 on the diagram below, which represents the Moon orbiting Earth as viewed from space above the North Pole. The Moon is shown at eight different positions in its orbit.



(Not drawn to scale)

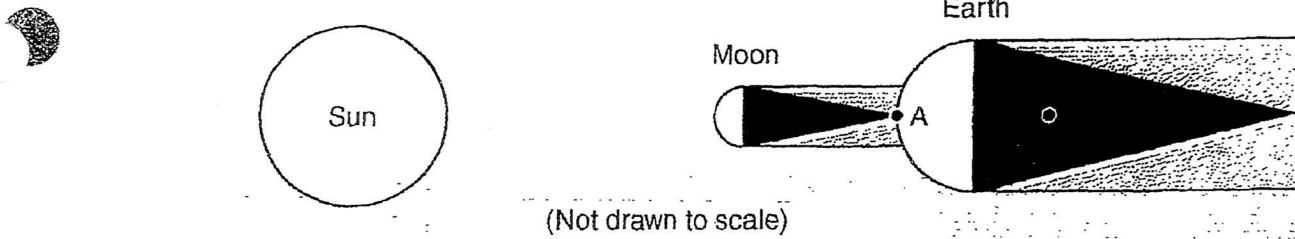


10. The approximate time required for the Moon to move from position 3 to position 7 is
 1) 1 hour 2) 2 weeks 3) 3 months 4) 4 days
11. As the Moon changes location from position 2 to position 6, the visible portion of the Moon as observed from Earth
 1) decreases, only 2) increases, only 3) decreases, then increases 4) increases, then decreases
12. Which device when placed on the Moon would provide evidence of Moon rotation?
 1) Foucault pendulum 2) seismograph 3) thermometer 4) wind vane
13. When the Moon is in position 2, which phase would be visible to an observer in Maine?
 1) 2) 3) 4)

waxing crescent

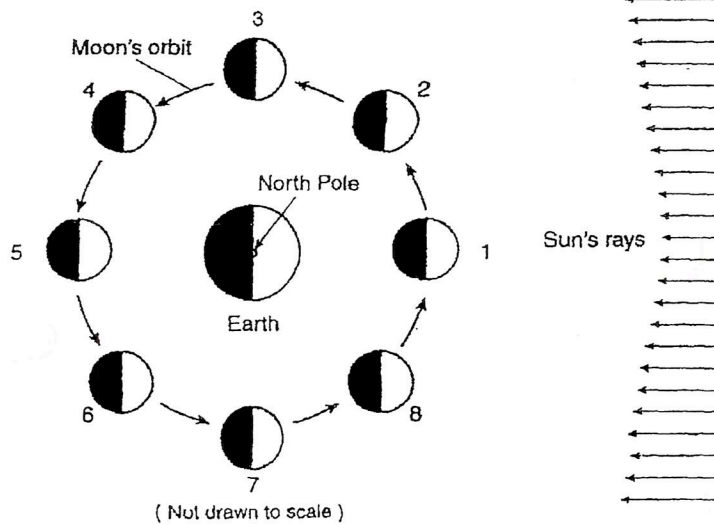
14. The same side of the Moon always faces Earth because the
 1) Moon's period of rotation is longer than its period of revolution around Earth
 2) Moon's period of rotation is shorter than its period of revolution around Earth
 3) Moon rotates once as it completes one revolution around Earth
 4) Moon does not rotate as it completes one revolution around Earth

15. The diagram below shows the relative positions of the Sun, the Moon, and Earth when an eclipse was observed from Earth. Positions *A* and *B* are locations on Earth's surface.



Which statement correctly describes the type of eclipse that was occurring and the position on Earth where this eclipse was observed?

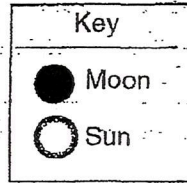
- 1) A lunar eclipse was observed from position *A*.
 2) A lunar eclipse was observed from position *B*.
 3) A solar eclipse was observed from position *A*.
 4) A solar eclipse was observed from position *B*.
16. The diagram below shows the Moon orbiting Earth as viewed from space above the North Pole. The Moon is shown at eight different positions in its orbit.



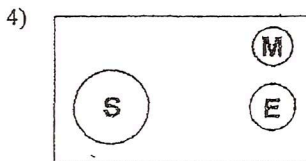
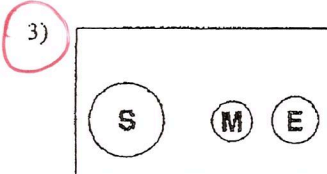
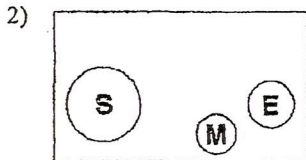
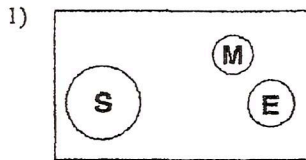
At which two positions of the Moon is an eclipse of the Sun or Moon possible?

- 1) 1 and 5
 2) 2 and 6
 3) 3 and 7
 4) 4 and 8

17. What is represented by the diagram below?

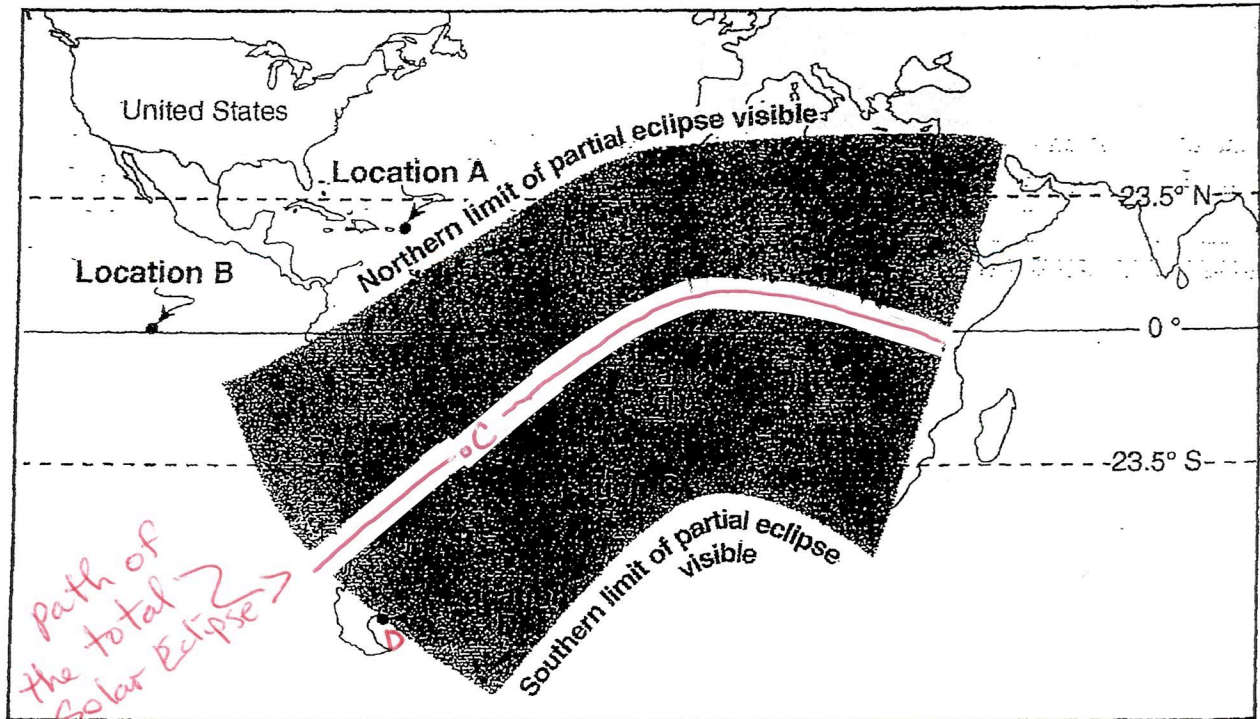


- 1) changing phases of the Sun
 - 2) changing phases of the Moon
 - 3) stages in an eclipse of the Sun
 - 4) stages in an eclipse of the Moon
18. Which arrangement of the Sun, the Moon, and Earth results in the highest high tides, and the lowest low tides on Earth? (Diagrams are not drawn to scale.)



Base your answers to questions 19 and 20 on the world map below, which shows regions of Earth where a solar eclipse was visible on May 20, 1947. Location A, B, C, and D are on Earth's surface.

Solar Eclipse May 20, 1947



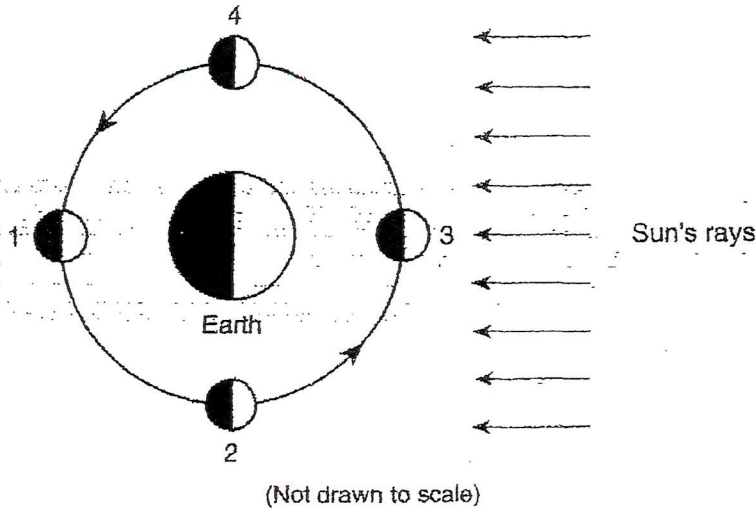
9. At which location could an observer have viewed this total solar eclipse if the skies were clear?

- 1) A 2) B 3) C 4) D

20. Which statement best describes the visibility of this eclipse from locations in New York State?

- 1) A total eclipse was visible all day. 3) A partial eclipse was visible only from noon until sunset.
2) A total eclipse was visible only from noon until sunset. 4) Neither a partial nor a total eclipse was visible.

21. The diagram below represents the Sun's rays striking Earth and the Moon. Numbers 1 through 4 represent positions of the Moon in its orbit around Earth.



The highest tides on Earth occur when the Moon is in positions

- 1) 1 and 3 2) 2 and 4 3) 3 and 2 4) 4 and 1

Base your answers to questions 22 and 23 on the reading passage below and on your knowledge of Earth science.

The Blue Moon

A "Blue Moon" is the name given to the second full moon in a calendar month. Because there are roughly 29.5 days between full moons, it is unusual for two full moons to "fit" into a 30 or 31 day month (and impossible to fit into a 28 or 29 day month, so February can never have a Blue Moon). The saying "Once in a Blue Moon" means a rare occurrence, and predates the current astronomical use of the term, which is quite recent. In fact, Blue Moons are not all that rare, on average there will be one Blue Moon every 2.5 years. After 1999, the next Blue Moons will be in November 2001; July 2004; and June 2007. The last one before 1999 was in July 1996.

The term Blue Moon is believed to have originated in 1883 after the eruption of Krakatoa. The volcano put so much dust in the atmosphere that the Moon actually looked blue in color. This was so unusual that the term "once in a Blue Moon" was coined.

"The Blue Moon"

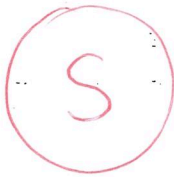
David R. Williams

nssdc.gsfc.nasa.gov/planetary/lunar/blue_moon.html

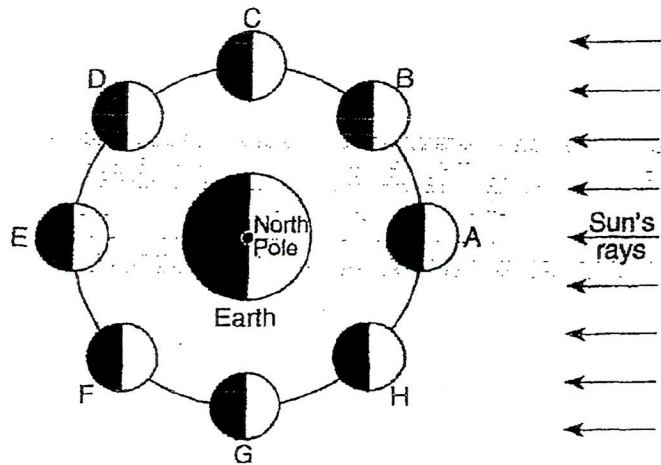
22. Explain why a Blue Moon never occurs during the month of February.

Feb. only has 28 or 29 days, a minimum of 29.5 days is needed

23. Draw the relative positions of Earth, the Moon, and the Sun, as viewed from space, so that a full-Moon phase would be visible to an observer on Earth. Label Earth, the Moon, and the Sun in your drawing.



Base your answers to questions 24 through 26 on the diagram below, which shows the Moon at positions A through H in its orbit around Earth.



(Not drawn to scale)

- 24. At which Moon position could a lunar eclipse occur? **E**
- 25. How many days does it take for the Moon to complete one cycle of phases as viewed from Earth? **29.5**
- 26. Which letters represent the *two* positions of the Moon when the *least* difference between the levels of high and low ocean tides occur on Earth? **C + G (Neap tides)**

Eclipses and Tides Homework

Multiple Choice -

- 1) During one 24 hour period, every point on Earth will experience _____.
a. one high tide **b. four tides** c. four low tides d. one low tide
- 2) You can see a lunar eclipse if you look into the sky during _____.
a. a new moon b. crescent moon c. the day **d. the night**
- 3) The area in a shadow in which all light is cut off is called the _____.
a. penumbra **b. umbra** c. postumbra d. true shadow
- 4) When the moon is in Earth's shadow, a _____ occurs.
a. solar eclipse b. new moon c. full moon **d. lunar eclipse**

Diagrams -

A. Use Figure 5-2 to answer Questions 1-4

- 1) What kind of eclipse is shown in Figure 5-2? Solar
- 2) During what moon phase can this type of eclipse occur? New Moon
- 3) Label the umbra and penumbra on the Figure.

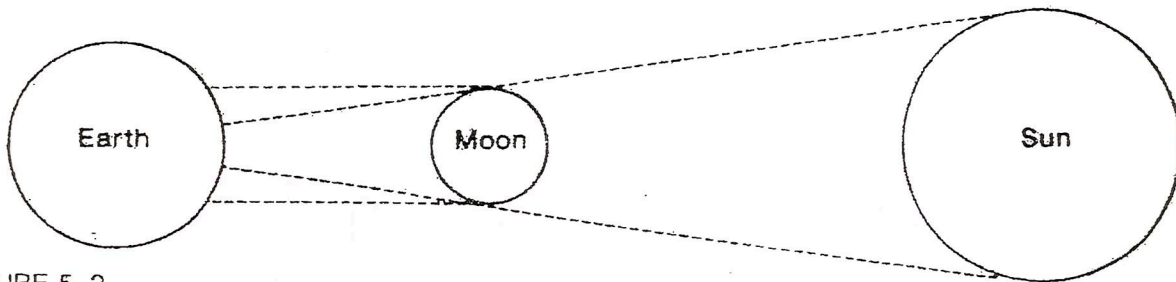


FIGURE 5-2.

- 4) Why don't we have a solar eclipse during every new moon phase?

Moon's orbit is tilted 5° relative to its plane of orbit

B. Draw a diagram of the Earth, moon, and sun for a lunar eclipse. Label the umbra and the penumbra

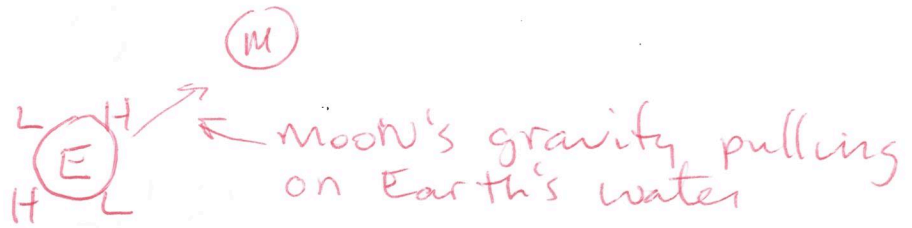


Answer the following questions based on your diagram

- 1) What is the phase of the moon during a lunar eclipse? Full Moon
2) Why does a lunar eclipse last much longer than a solar eclipse?

Earth's Shadow is much larger than the Moon's Shadow

C. Draw a diagram of the Earth and moon which shows how the tides occur.



- 1) How many high tides occur every 24 hours? approx. 2
2) How many hours are there between high tide and low tide? 6 hrs 13 mins
3) If the Earth, moon and sun all lined up (see figure 5-2), how do you think that would affect the tides?

It would cause Spring tides
highest high tides of the lunar cycle