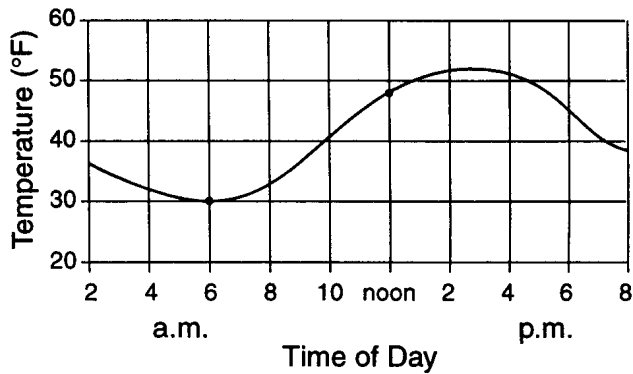

1. An observer recorded the times of three successive high tides at one Earth location as:

- 7:12 a.m.
- 7:38 p.m.
- 8:04 a.m.

What was the time of the next high tide?

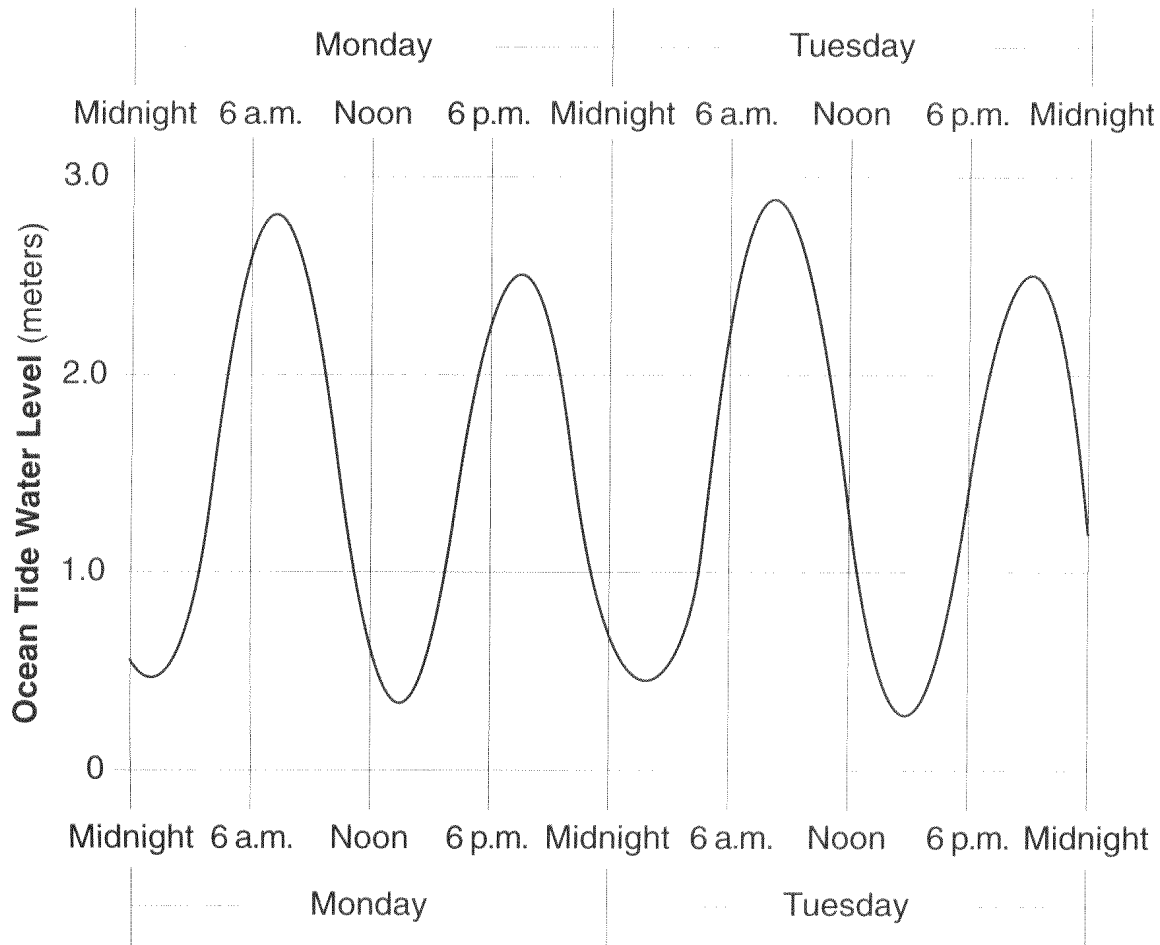
- A) 8:12 p.m. **B) 8:30 p.m.**
C) 8:38 p.m. D) 9:04 p.m.
2. The graph below shows temperature readings for a day in April.



The average rate of temperature change, in Fahrenheit degrees per hour, between 6 a.m. and noon was

- A) 6°/hr B) 8°/hr
C) **3°/hr** D) 18°/hr
-

Base your answers to questions 3 through 5 on the graph below, which shows the water levels of ocean tides measured in Boston, Massachusetts, for a 2-day period.



- The graph shows that high tides at Boston occur approximately every
A) 3.5 hours B) 6.0 hours C) **12.5 hours** D) 16.0 hours
- If the trends shown by the graph continue, which statement best describes the next low tide at Boston that is expected to occur on Wednesday?
A) **It will occur about 3 a.m. with a 0.4-meter water level.**
B) It will occur about 6 a.m. with a 0.6-meter water level.
C) It will occur about 9 p.m. with a 2.6-meter water level.
D) It will occur about 10 p.m. with a 2.8-meter water level.
- The gravitational pull of the Moon has the greatest influence on the water levels of Earth's ocean tides. If the distance between the Moon and Earth were to *decrease* steadily for the week following the time shown on the graph, which water-level changes would be expected to occur?
A) **High tides would get higher and low tides would get lower.**
B) High tides would get lower and low tides would get higher.
C) Both high tides and low tides would get higher.
D) Both high tides and low tides would get lower.

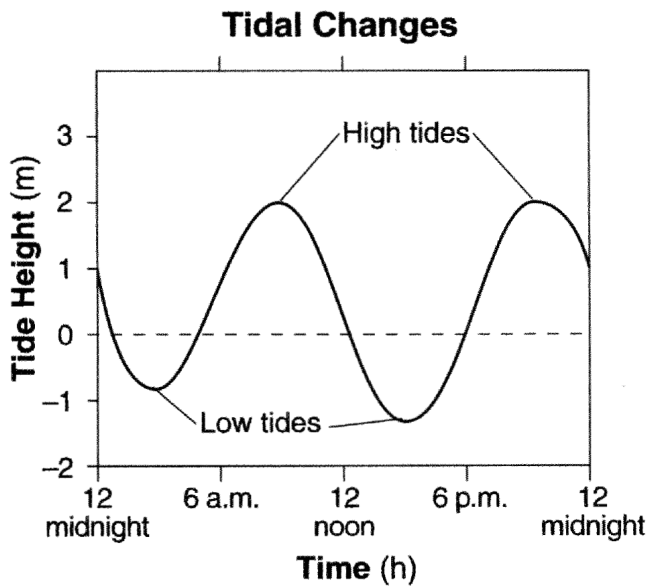
6. The rising and setting of the Sun are examples of

- A) noncyclic events
- B) unrelated events
- C) **predictable changes**
- D) random motion

7. Scientists can plan to photograph a solar eclipse because most astronomical events are

- A) **cyclic and predictable**
- B) cyclic and unpredictable
- C) random and predictable
- D) random and unpredictable

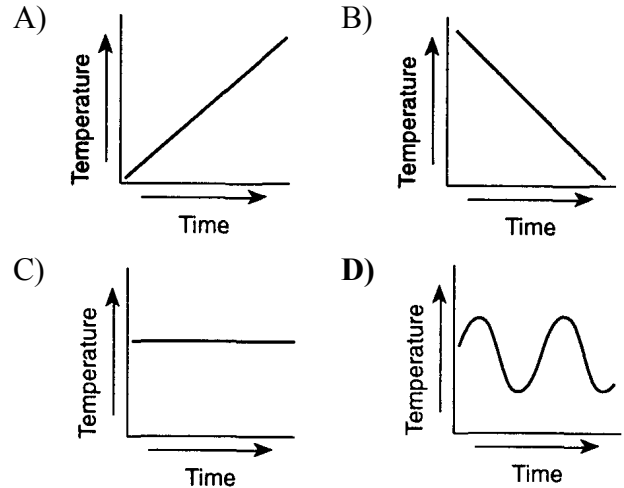
8. The graph below shows the tidal changes in ocean water level, in meters, recorded at a coastal location on a certain day.



Approximately how many hours apart were the two high tides?

- A) 6 h
- B) 12 h**
- C) 18 h
- D) 24 h

9. Which graph most likely illustrates a cyclic change?



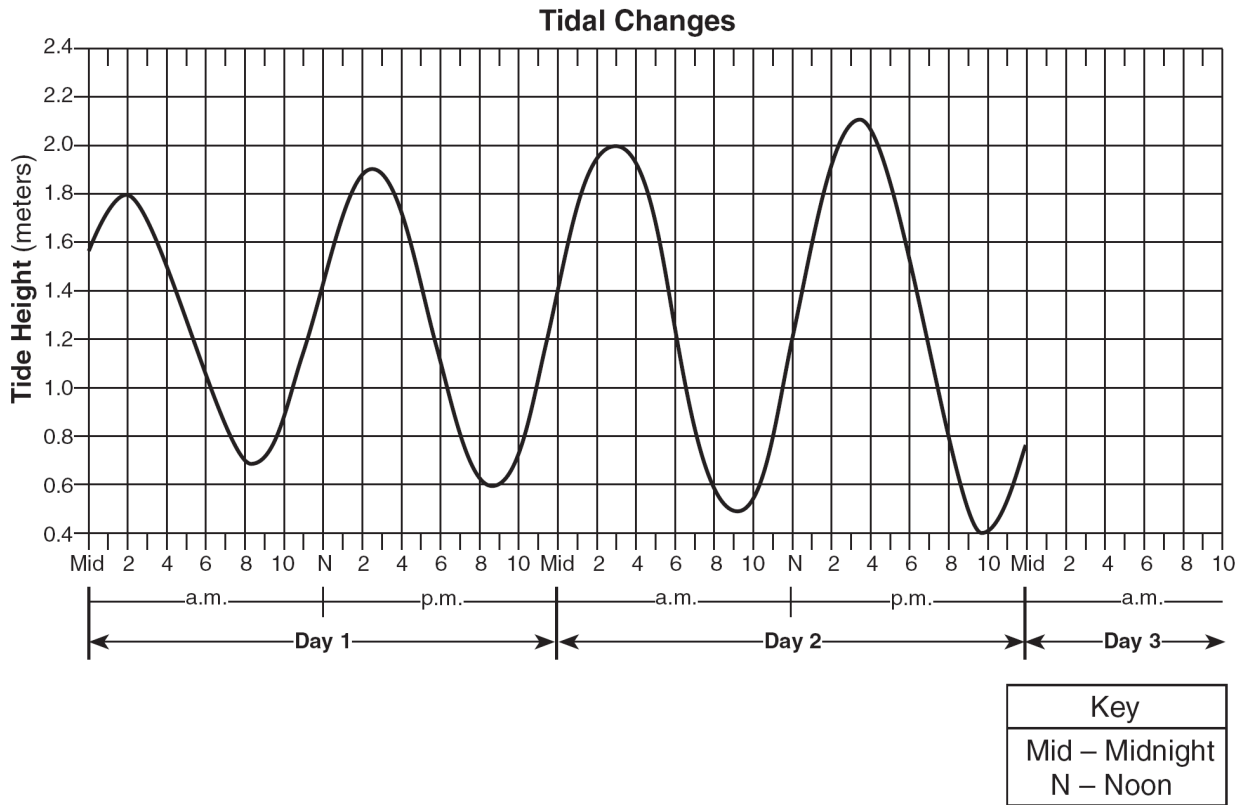
10. The elevation of a certain area was measured for many years, and the results are recorded in the data table below.

Year	Elevation (m)
1870	102.00
1890	102.25
1910	102.50
1930	102.75
1950	103.00

If the elevation continued to increase at the same rate, what was most likely the elevation of this area in 1990?

- A) 103.25 m
- B) 103.50 m**
- C) 103.75 m
- D) 104.00 m

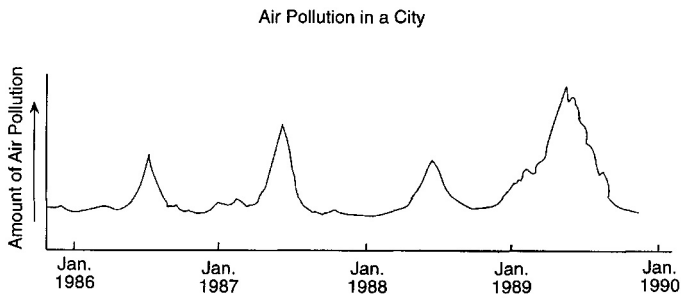
11. Base your answer to the following question on the graph below, which shows two days of tidal data from a coastal location in the northeastern United States.



If the pattern shown continues, the most likely height and time for the first high tide on day 3 would be

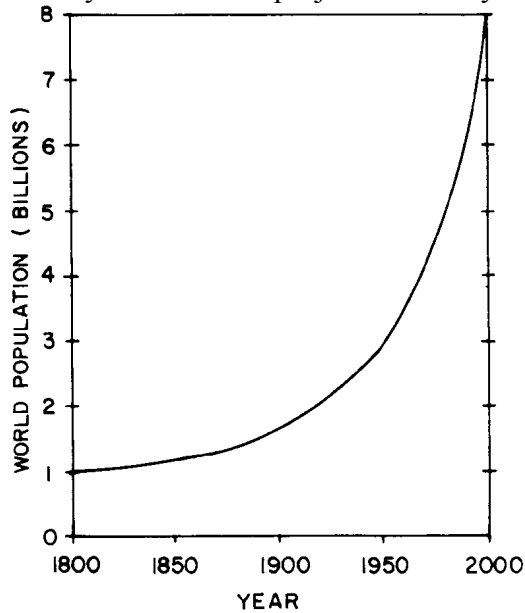
- A) 2.2 meters at 4 a.m. B) 2.3 meters at 4 a.m.
 C) 2.2 meters at 5 a.m. D) 2.3 meters at 5 a.m.

12. The graph below shows the relative amount of air pollution over a city for a period of several years.



Which statement about air pollution over this city is best supported by the graph?

- A) It is decreasing at a constant rate.
 B) It is increasing at a constant rate.
 C) **It is a cyclic event.**
 D) It has no pattern.
13. The graph below shows world population beginning in the year 1800 and projected to the year 2000.



The graph shows the greatest increase in population between

- A) 1825 and 1850 B) 1875 and 1900
 C) 1925 and 1950 **D) 1975 and 2000**

14. A student recorded the times of three successive high tides at one location as:

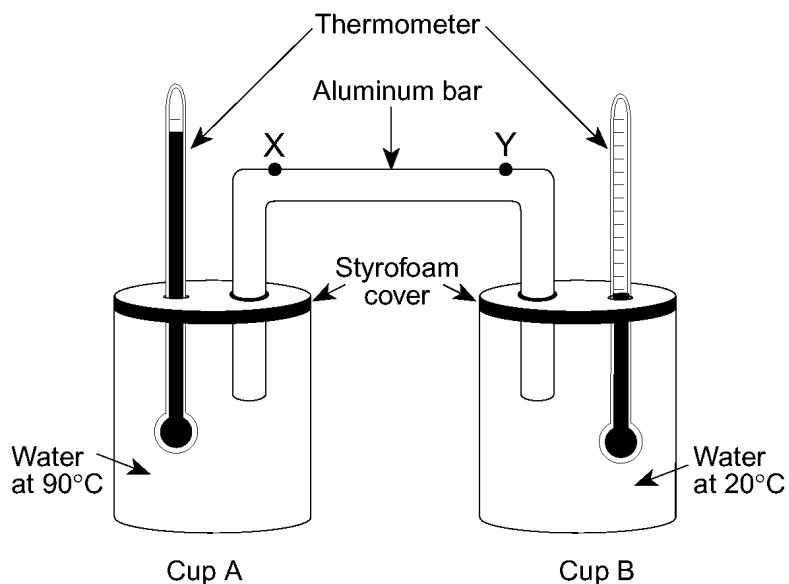
9:12 a.m.
 9:38 p.m.
 10:04 a.m.

What is the approximate time of the next high tide?

- A) 10:12 p.m. **B) 10:30 p.m.**
 C) 10:38 p.m. D) 11:04 p.m.

Base your answers to questions 15 and 16 on the information about a laboratory procedure, diagram, and data table below.

Hot water at 90°C is poured into cup *A*. Cool water at 20°C is poured into cup *B*. Styrofoam covers are placed on the cups. An aluminum bar and a thermometer are placed through holes in each cover. Points *X* and *Y* are locations on the aluminum bar. The data table shows temperature readings taken every minute for 20 minutes.



	Temperature of Water ($^{\circ}\text{C}$)	
Minute	Cup A	Cup B
0	90	20
1	88	20
2	86	20
3	85	21
4	83	21
5	82	22
6	81	22
7	80	22
8	79	22
9	78	23
10	77	23
11	76	23
12	75	23
13	74	23
14	73	23
15	72	24
16	71	24
17	70	24
18	69	24
19	68	25
20	67	25

15. The rate of temperature change for the water in cup *A* for the first 10 minutes was approximately

- A) $0.77\text{ }^{\circ}\text{C}/\text{min}$ B) $1.3\text{ }^{\circ}\text{C}/\text{min}$ C) $7.7\text{ }^{\circ}\text{C}/\text{min}$ D) $13.0\text{ }^{\circ}\text{C}/\text{min}$

16. Which change in the experiment would increase the heating rate of the water in cup *B*?

- A) making the aluminum bar shorter between points *X* and *Y*
B) making the aluminum bar longer between points *X* and *Y*
C) keeping cup *A* covered, but uncovering cup *B*
D) keeping cup *B* covered, but uncovering cup *A*

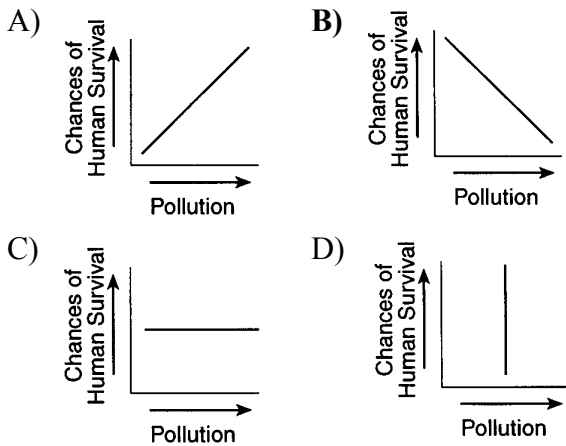
17. Future changes in the environment can best be predicted from data that are
- A) highly variable and collected over short periods of time
 - B) highly variable and collected over long periods of time
 - C) cyclic and collected over short periods of time
 - D) cyclic and collected over long periods of time**
18. Which event is most predictable?

- A) The Sun rises.**
- B) An earthquake occurs.
- C) A meteorite falls to Earth.
- D) Coral fossils are found on mountaintops.

19. Which description of change is most closely associated with ocean tides and moon phases?

- A) cyclic and predictable**
- B) cyclic and unpredictable
- C) noncyclic and predictable
- D) noncyclic and unpredictable

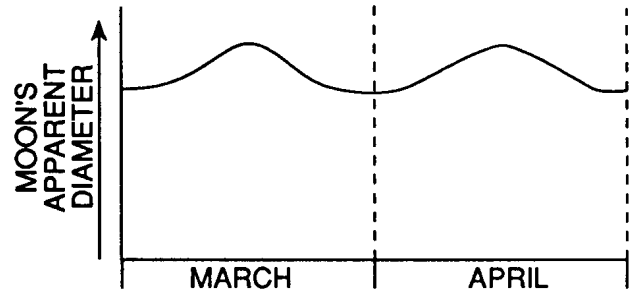
20. Which graph shows the most probable effect of environmental pollution on the chances of human survival?



21. Which factor can be predicted most accurately from day to day?

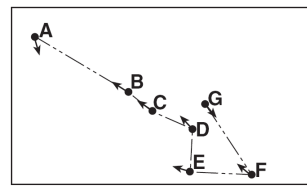
- A) chance of precipitation
- B) direction of the wind
- C) time of an earthquake occurring
- D) altitude of the Sun at noon**

22. An observer on the Earth measured and recorded the slight changes in the apparent diameter of the Moon for 2 months. A graph of the data is shown below.

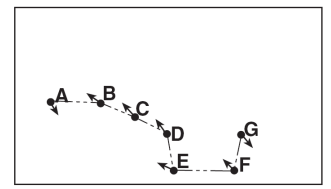


Which statement best explains the observation:

- A) The Moon actually increases and decreases in size each month.
 - B) The apparent diameter of the Moon is always greatest at the new-moon phase.
 - C) The distance from the Earth to the Moon varies in a cyclic manner.**
 - D) The Earth revolves around the Moon each month.
23. The diagrams below show apparent changes in the positions of the stars in the Big Dipper that have occurred in the past 200,000 years. The directions of individual star movements as seen from Earth are shown by the arrows.

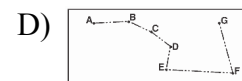
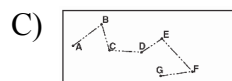
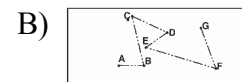
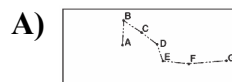


As it was 200,000 years ago



As it is today

Which diagram best represents how the Big Dipper will appear when viewed from Earth in 20,000 years?

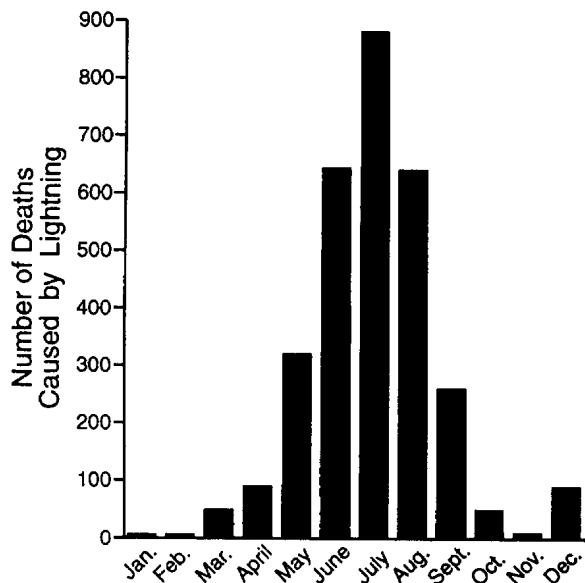


24. Two geologic surveys of the same area, made 50 years apart, showed that the area had been uplifted 5 centimeters during the interval. If the rate of uplift remains constant, how many years will it take for this area to be uplifted a total of 70 centimeters?

- A) 250 years B) 350 years
C) 500 years **D) 700 years**

25. The graph below shows the total number of deaths per month caused by lightning in the United States between 1959 and 1990.

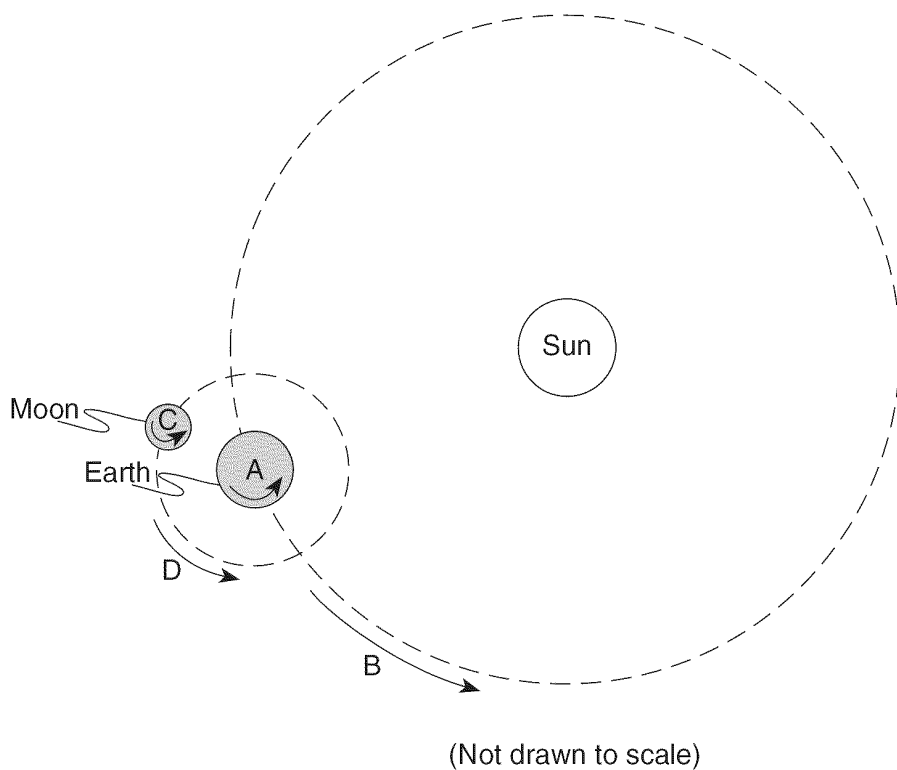
Total Deaths by Lightning (1959 – 1990)



Based on the information on the graph, which prediction about lightning deaths in the United States in the year 2000 would be most accurate?

- A) Most deaths will occur along the eastern coastline.
B) The number of deaths will exceed 900.
C) The greatest number of deaths will occur during summer.
D) Most deaths will be the result of hurricanes.
-

26. Base your answer to the following question on the diagram below, which has lettered arrows showing the motions of Earth and the Moon.

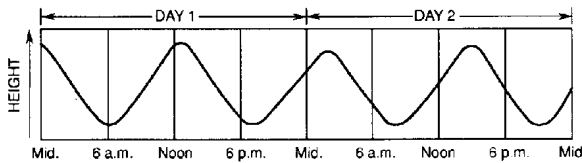


Key	
Arrow	Motion
A	Earth's rotation on its axis
B	Earth's revolution around the Sun
C	The Moon's rotation on its axis
D	The Moon's revolution around Earth

These lettered arrows represent motions that are

- A) noncyclic and unpredictable B) noncyclic and predictable
 C) cyclic and unpredictable **D) cyclic and predictable**
-
27. A 25-gram sample of halite was placed in a jar with five other mineral samples and water. The jar was shaken vigorously for 5 minutes. The halite sample was then found to have a mass of 15 grams. What was the rate of weathering of the halite sample?
- A) 0.50 g/min **B) 2.0 g/min**
 C) 3.0 g/min D) 10. g/min
28. Ocean tides are best described as
- A) unpredictable and cyclic
 B) unpredictable and noncyclic
 C) **predictable and cyclic**
 D) predictable and noncyclic
29. The cyclic rise and fall of ocean tides on Earth is primarily caused by Earth's rotation and the
- A) temperature differences in ocean currents
 B) revolution of Earth around the Sun
 C) direction of Earth's planetary winds
 D) **gravitational attraction of the Moon and the Sun**

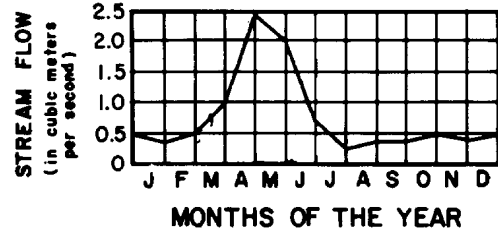
30. The graph below shows the changes in height of ocean water over the course of 2 days at one Earth location.



Which statement concerning these changes is best supported by the graph?

- A) **The changes are cyclic and occur at predictable time intervals.**
- B) The changes are cyclic and occur at the same time every day.
- C) The changes are noncyclic and occur at sunrise and sunset.
- D) The changes are noncyclic and may occur at any time.

31. The graph below shows the discharge measured at a point in a stream during a period of one year.



The greatest change in stream flow occurs between

- A) January 1 and March 1
- B) **March 1 and May 1**
- C) May 1 and July 1
- D) October 1 and December 1