A grayscale photograph of a hand holding a pen, writing on lined paper. The text on the paper is mirrored and appears to be 'The things that we have started for them'.

Chapter 6 Science Practice Test



SCIENCE TEST

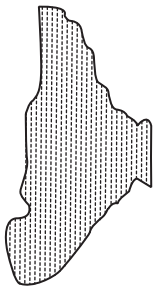
35 Minutes–40 Questions

Directions: There are seven passages in this test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

You are NOT permitted to use a calculator on this test.

Passage I

Moth body coloration (see Figure 1) is a *hereditary* trait that can be passed from organisms to their offspring.



white body coloration



black body coloration

Figure 1

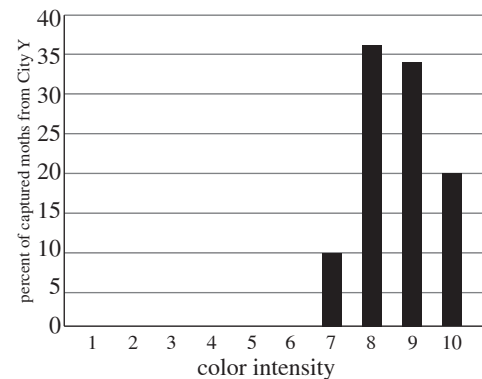
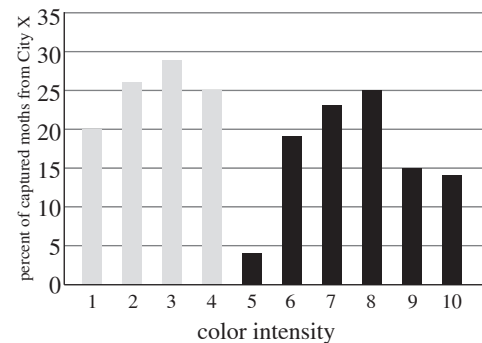
Scientists studied the body coloration of 2 subspecies of moths, *Biston betularia f. typica* and *Biston betularia f. carbonaria*. Both species live in City X. Only *B. betularia f. typica* lives in City Y, while only *B. betularia f. carbonaria* lives in City Z. Both subspecies live on trees found in temperate climates, such as birch. Moths with light body coloration are camouflaged from predators while living on light-colored trees but are not hidden in heavily polluted areas where the tree bark is darkened. Moths with dark body coloration are camouflaged from predators on trees that are darkened by pollution but not on light-colored trees.

Study 1

Scientists captured 100 *B. betularia f. typica* and 100 *B. betularia f. carbonaria* in City X. They labeled each one, recorded its color, and released it. Then they calculated the percent of birds having each of the body color intensities on a scale of 1 to 10, with 1 being completely black and 10 being completely white. The researchers followed the same methods with 100 *B. betularia f. typica* moths from City Y and 100 *B. betularia f. carbonaria* moths from City Z. The results of this study are shown in Figure 2.

Study 2

After the end of Study 1, the scientists returned to City Y over the course of 10 years, from 1983 to 1992. During each visit, they captured at least 50 *B. betularia f. typica* moths and measured their body color intensities. They then calculated the average *B. betularia f. typica* body color intensity from the 1–10 scale for each of the 10 years. The scientists noted that during the 10-year period, 2 years were particularly wet, while 3 years were especially dry (see Figure 3). During wet years, pollutants tend to be washed from the surfaces of tree bark. During dry years, pollutants are more likely to concentrate on tree bark, and the tree bark itself tends to become thicker.



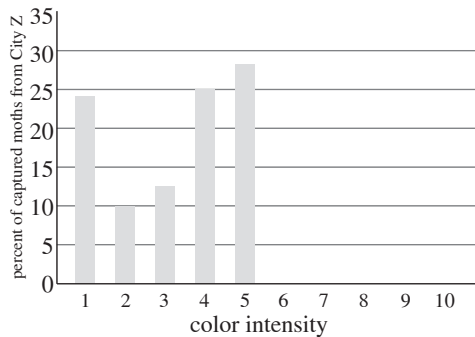


Figure 2

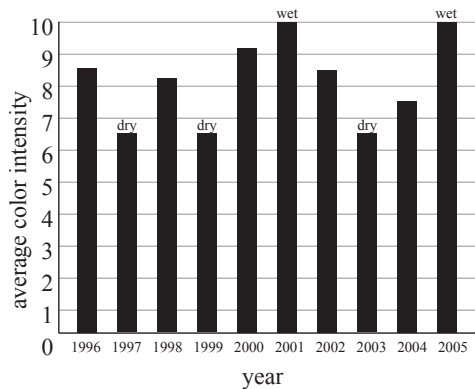


Figure 3

1. Based on the results from Study 1, the largest percentage of moths in City Y and City Z had a color intensity of:

City Y City Z

- A. 8 1
 B. 8 5
 C. 9 4
 D. 9 5
2. During which of the following years was birch bark most likely to be thickest in City Y ?
- F. 2000
 G. 2001
 H. 2002
 J. 2003
3. How was Study 1 different from Study 2 ?
- A. *B. betularia* f. *carbonaria* moths were captured in Study 1 but not in Study 2.
 B. *B. betularia* f. *typica* moths were captured in Study 1 but not in Study 2.
 C. The moth body coloration was measured in Study 1 but not in Study 2.
 D. The moth body coloration was measured in Study 2 but not in Study 1.

4. The scientists most likely labeled the moths in Study 1 to:
- F. determine how body coloration was affected by pollution in City X.
 G. determine the average wingspan of each population of moths.
 H. make sure that the body coloration of each moth was measured only once.
 J. make sure that the body coloration of each moth was measured multiple times.

5. Based on the results from Study 2, would a moth with a body color intensity measuring 6.5 or a moth with a body color intensity measuring 9.5 have had a greater chance of surviving in 2005 ?
- A. A moth with a body color intensity of 6.5, because pollutants concentrate more on tree bark during dry years.
 B. A moth with a body color intensity of 6.5, because pollutants are removed from tree bark during dry years.
 C. A moth with a body color intensity of 9.5, because pollutants concentrate more on tree bark during dry years.
 D. A moth with a body color intensity of 9.5, because pollutants are removed from tree bark during dry years.

6. A scientist hypothesized that there would be a greater range in body coloration in the *B. betularia* f. *typica* moths when they are forced to coexist with another subspecies of moths. Do the results from Study 1 support this hypothesis?
- F. Yes; the range of body coloration for *B. betularia* f. *typica* moths was greater in City X than in City Y.
 G. Yes; the range of body coloration for *B. betularia* f. *typica* moths was greater in City Y than in City X.
 H. No; the range of body coloration for *B. betularia* f. *typica* moths was greater in City X than in City Y.
 J. No; the range of body coloration for *B. betularia* f. *typica* moths was greater in City Y than in City X.

Passage II

Ions in seawater, such as Cl^- , SO_4^{2-} , Na^+ , and Mg^{2+} , are carried down to the ocean floor through a process known as *marine deposition*. SO_4^{2-} and Mg^{2+} primarily come from the erosion of rocks, while Cl^- and Na^+ come from both mineral erosion and underwater volcanoes and hydrothermal vents.

Study 1

A fluid motion sensor was placed on a section of the seabed in the Atlantic Ocean, and data were collected over 12 months. At 6:00 a.m. every morning, the movement of water past the sensor was recorded, and a small amount of water was sequestered. Figure 1 shows the movement of water in millions of cubic meters (m^3) per second.

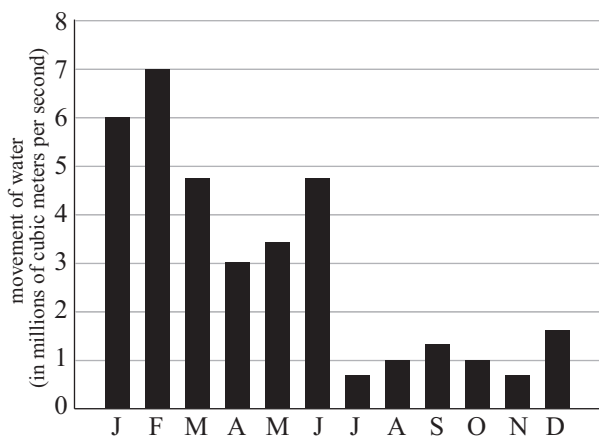


Figure 1

At the end of each month, the sequestered water was extracted by a science research crew, and a portion was analyzed for the concentrations of Cl^- and SO_4^{2-} ions. Using these data, the marine deposition was measured in kilograms (kg) per cubic meter (m^3) for each substance in each month (see Figure 2).

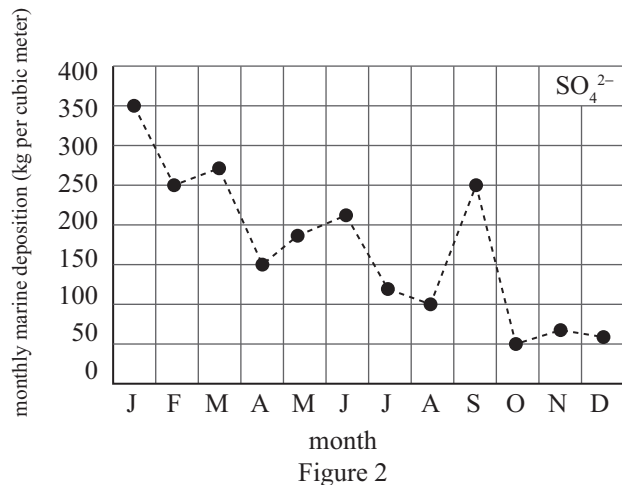
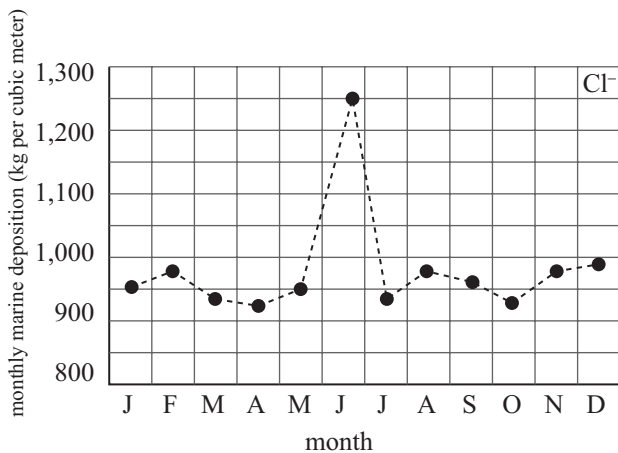


Figure 2

Study 2

Another portion of the monthly water sample was analyzed for concentrations of Na^+ and Mg^{2+} ions. The monthly marine deposition was calculated for each substance in equivalents (Eq) per m^3 (see Figure 3).

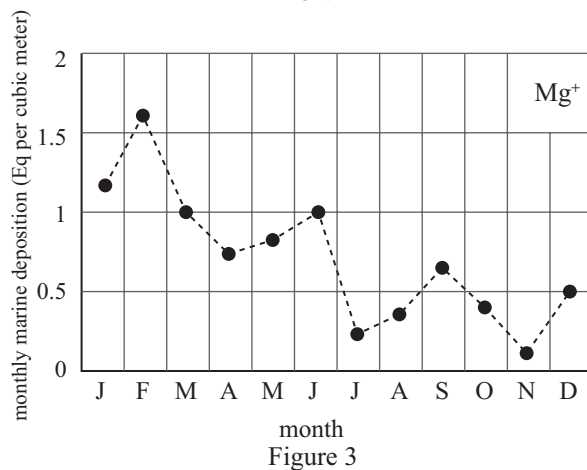
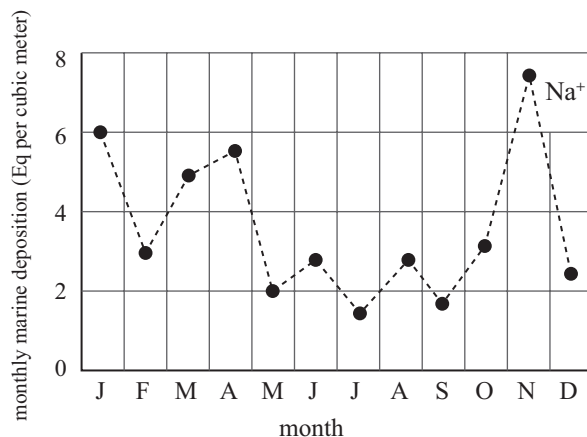


Figure 3

Study 3

The annual marine deposition of Cl^- and SO_4^{2-} ions over the 12-month period was calculated in kg/m^3 at the test site, and also at two sites in the Arctic Ocean, located 2,000 and 4,000 miles north, respectively (see Figure 4).

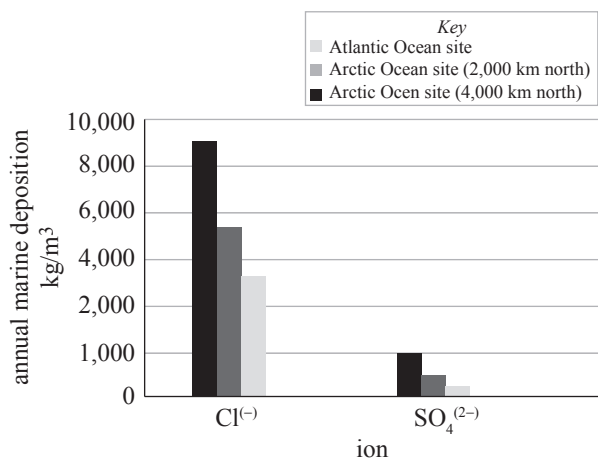


Figure 4

7. According to Figure 1, during the year over which data were collected, the movement of water was greatest in February and least in November. According to Figures 2 and 3, the marine deposition of which ion was also greatest in February and least in November?

A. Cl^-
 B. Mg^{2+}
 C. Na^+
 D. SO_4^{2-}

8. Based on the results from Study 1, the mean monthly marine deposition for Cl^- over the year of the study was:

F. less than $900 \text{ kg}/\text{m}^3$.
 G. between $900 \text{ kg}/\text{m}^3$ and $1,000 \text{ kg}/\text{m}^3$.
 H. between $1,000 \text{ kg}/\text{m}^3$ and $1,200 \text{ kg}/\text{m}^3$.
 J. over $1,200 \text{ kg}/\text{m}^3$.

9. A student states, "The marine deposition of Na^+ is highest in the winter and lowest in the summer, since the winter features greater activity of volcanoes and hydrothermal vents." Is this statement supported by the results of Study 2?

A. No, because marine deposition of Na^+ was, on average, greater between November and January than it was between June and August.
 B. No, because marine deposition of Na^+ was, on average, less between November and January than it was between June and August.
 C. Yes, because marine deposition of Na^+ was, on average, greater between November and January than it was between June and August.
 D. Yes, because marine deposition of Na^+ was, on average, less between November and January than it was between June and August.

10. Suppose that the fluid motion sensor was placed in an underwater cave in the Atlantic Ocean where there is no net movement of water during one month of the 12-month study. The information provided indicates that during that month, there would have been:

F. no marine deposition of any of the 4 substances.
 G. no marine deposition of Cl^- and SO_4^{2-} , but a high level of marine deposition of Na^+ and Mg^{2+} .
 H. high marine deposition of Cl^- and SO_4^{2-} , but no marine deposition of Na^+ and Mg^{2+} .
 J. high marine deposition of all 4 substances.

11. According to Study 3, as the distance from the fluid motion sensor in the Atlantic Ocean decreased, the annual marine deposition:

A. decreased for both Cl^- and SO_4^{2-} .
 B. decreased for Cl^- but increased for SO_4^{2-} .
 C. increased for Cl^- but decreased for SO_4^{2-} .
 D. increased for both Cl^- and SO_4^{2-} .

12. Which of the following variables remained constant in Study 2?

F. Marine deposition of SO_4^{2-}
 G. Marine deposition of Mg^{2+}
 H. Movement of water during the month
 J. Location of the study

Passage III

Leaf area index is a unitless measure of the percent of a rainforest floor that is covered by the leaves of tall trees. Leaf area index may increase because of an increase in *precipitation* (measured as millimeters of rainfall per km^2 per year). Table 1 shows how the leaf area index formed by the *canopy layer* (30 to 45 m above the rainforest floor) varies with precipitation in a 1000 km^2 section of the Amazon Rainforest. Figures 1–3 show the relative precipitation, RP (the percent below the rainfall measured on January 1, 1985), and the monthly average leaf area index of the *emergent layer* (45 to 55 m above the rainforest floor), *canopy layer*, and *understory layer* (0 to 30 m above the rainforest floor), respectively, from January 1990 to January 2005.

Table 1

Precipitation ($\text{mm}/\text{km}^2/\text{yr}$)	Leaf area index
1.80	5.2
1.85	5.4
1.90	5.6
1.95	5.8
2.00	6.0

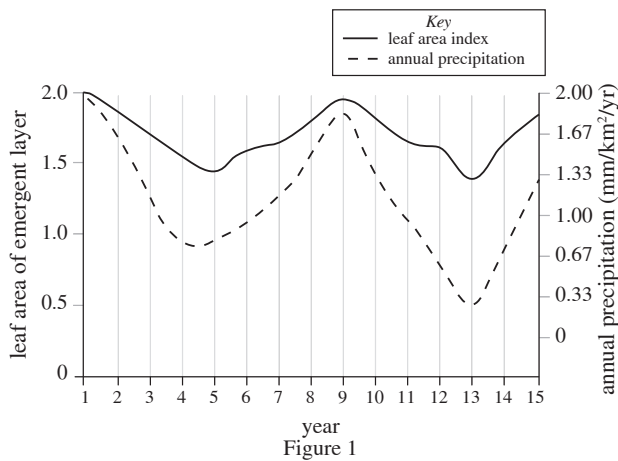


Figure 1

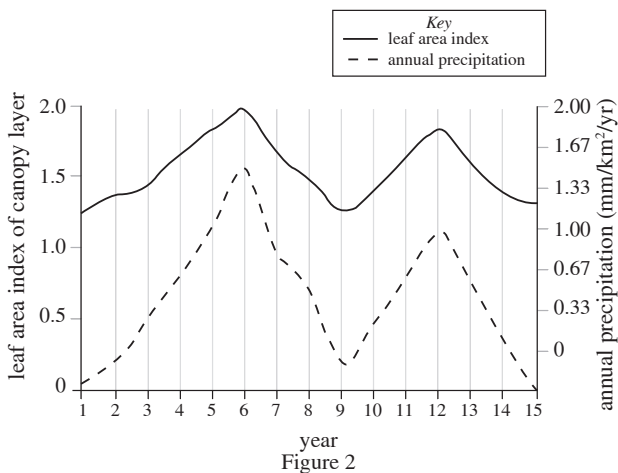


Figure 2

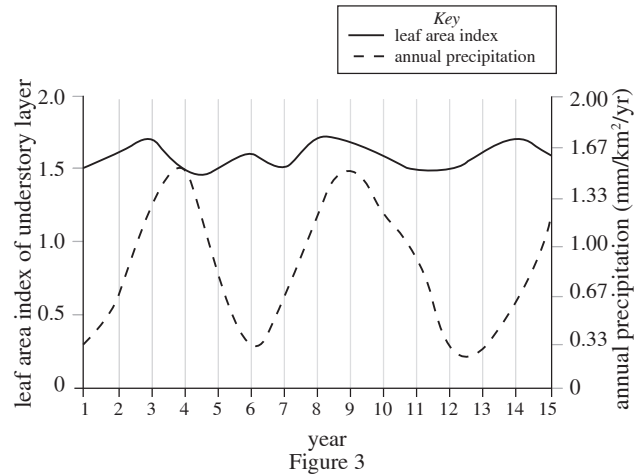


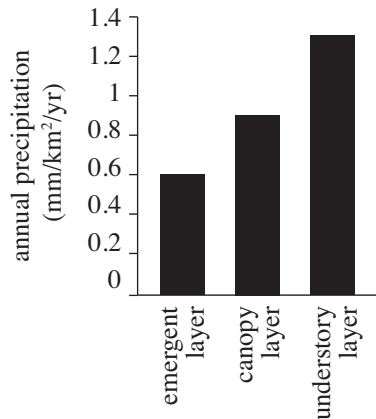
Figure 3

13. The leaf area index of the canopy layer covering the section of the rainforest in January of the 14th year studied was closest to which of the following?
 - A. 1.0
 - B. 1.3
 - C. 1.7
 - D. 2.0
14. Based on Table 1, a precipitation of $1.70 \text{ mm}/\text{km}^2/\text{yr}$ would correspond to a leaf area index that is closest to which of the following?
 - F. 4.8
 - G. 5.5
 - H. 6.0
 - J. 6.5
15. A botanist states, "The leaf area index of the understory layer is more directly correlated with annual precipitation than is the leaf area index of the canopy layer." Is this statement consistent with Figures 2 and 3?
 - A. No, because the plot for the leaf area index of the canopy layer more closely resembles the plot for the annual precipitation.
 - B. No, because the plot for the leaf area index of the understory layer more closely resembles the plot for the annual precipitation.
 - C. Yes, because the plot for the leaf area index of the canopy layer more closely resembles the plot for the annual precipitation.
 - D. Yes, because the plot for the leaf area index of the understory layer more closely resembles the plot for the annual precipitation.

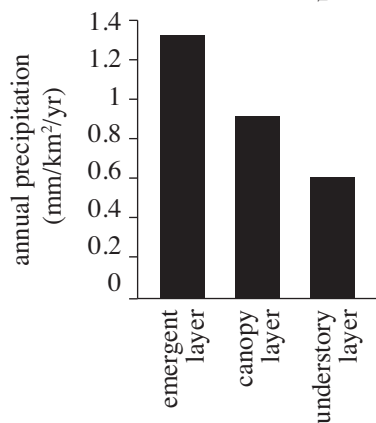


16. Which of the following figures best represents the leaf area index measured in the 7th year of the study?

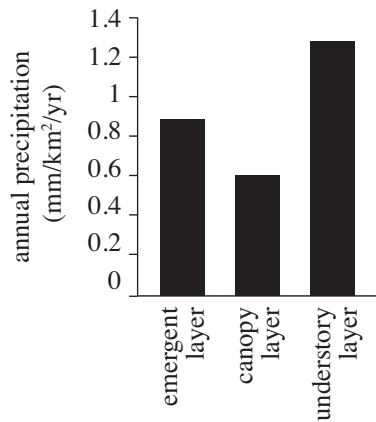
F.



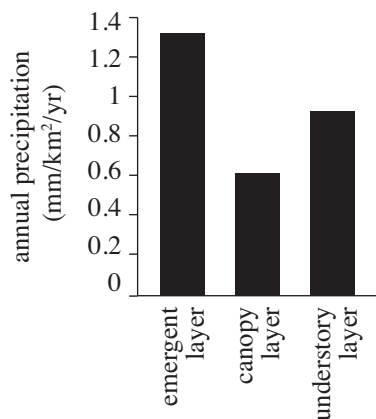
G.



H.



J.



17. The emergent layer is primarily composed of small leaves that cover a wide area, while the understory layer is primarily composed of broad leaves that cover a small area. This difference is most likely because the average precipitation at heights of:

- A. 0 to 30 m above the rainforest floor is above 2.00 mm/km²/yr, whereas the average precipitation at heights of 30–45 m above the rainforest floor is below 0.33 mm/km²/yr.
- B. 0 to 30 m above the rainforest floor is above 2.00 mm/km²/yr, whereas the average precipitation at heights of 45–55 m above the rainforest floor is below 0.33 mm/km²/yr.
- C. 0 to 30 m above the rainforest floor is below 0.33 mm/km²/yr, whereas the average precipitation at heights of 30–45 m above the rainforest floor is above 2.00 mm/km²/yr.
- D. 0 to 30 m above the rainforest floor is below 2.00 mm/km²/yr, whereas the average precipitation at heights of 45–55 m above the rainforest floor is above 1.33 mm/km²/yr.

Passage IV

Oxidation-reduction titration is a method in which precise volumes of a *titrant* (an oxidizing or reducing agent) are added dropwise to a known volume of an *analyte* (a reducing or oxidizing agent, respectively). This process can be monitored by adding a *redox indicator* (a substance that changes color over a certain range of electrode potentials) to the analyte or by measuring the sample's *voltage* using a potentiometer. Voltage (measured in kilovolts, kV) is a measure of the force of an electrical current that could be transmitted by the solution.

Two titration experiments were performed at 298 K using a 0.10 M iodine (I_2) solution and either a 0.0010 M sulfur dioxide (SO_2) solution or a 0.0010 M sodium thiosulfate solution (where M is the number of moles of oxidizing or reducing agent per liter of solution). All solutions were aqueous. A redox indicator solution of *starch* was also used. Starch and I_2 form a complex with a deep blue color, but when I_2 is reduced to 2 iodide (I^-) ions, the complex dissipates and the solution becomes colorless.

Experiment 2

Experiment 1 was repeated, except that the sodium thiosulfate solution was used instead of the SO_2 solution (see Figure 2).

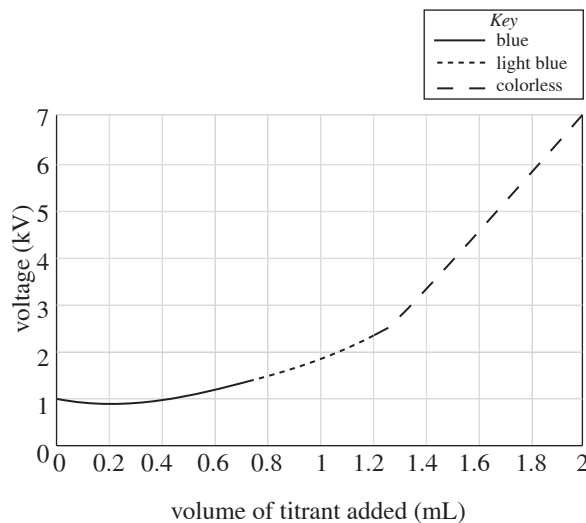


Figure 2

Experiment 1

A drop of starch solution was added to an Erlenmeyer flask containing 100.0 mL of the SO_2 solution. A potentiometer, which acts as a control input for electronic circuits, was placed in the solution. The I_2 solution was incrementally added to the SO_2 solution. After each addition, the SO_2 solution was stirred and the solution's color and voltage were recorded (see Figure 1).

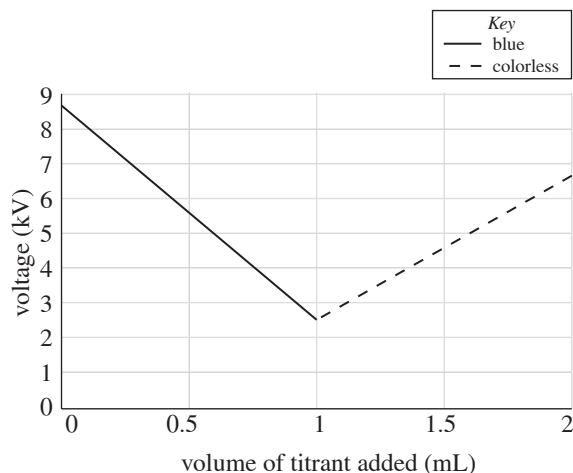


Figure 1

18. In Experiment 1, the analyte was blue at which of the following volumes of titrant added?
 - F. 0.7 mL
 - G. 1.1 mL
 - H. 1.5 mL
 - J. 1.9 mL
19. In Experiment 2, the analyte was in its reduced form for which of the following volumes of titrant added?
 - A. 0.3 mL
 - B. 0.6 mL
 - C. 0.9 mL
 - D. 1.2 mL
20. In Experiment 1, if 2.5 mL of titrant was added to the analyte, the voltage would most likely have been:
 - F. less than 1 kV.
 - G. between 1 kV and 4 kV.
 - H. between 4 kV and 7 kV.
 - J. more than 7 kV.



21. In Experiment 2, which solution was the analyte and which solution was the titrant?

titrant

sample solution

- | | |
|-----------------------|--------------------|
| A. Sodium thiosulfate | I |
| B. SO_2 | I_2 |
| C. I_2 | Sodium thiosulfate |
| D. I_2 | SO_2 |
22. In Experiments 1 and 2, the potentiometer that was placed in the analyte most likely did which of the following?
- F. Detected the concentration of starch in the solution
 - G. Conducted an electric current initiated by ions in the solution
 - H. Heated the solution to its boiling point
 - J. Cooled to solution to its freezing point

23. A chemist states that in Experiment 2, the analyte was fully reduced with 0.2 mL of titrant added, but not with 1.8 mL of titrant added. Do the results of Experiment 2 support this claim?

- A. Yes; at a value of 0.2 mL of titrant added, the analyte was blue, while at a value of 1.8 mL of titrant added, the analyte was colorless.
- B. Yes; at a value of 0.2 mL of titrant added, the analyte was colorless, while at a value of 1.8 mL of titrant added, the analyte was blue.
- C. No; at a value of 0.2 mL of titrant added, the analyte was blue, while at a value of 1.8 mL of titrant added, the analyte was colorless.
- D. No; at a value of 0.2 mL of titrant added, the analyte was colorless, while at a value of 1.8 mL of titrant added, the analyte was blue.

**Passage V**

An astrophysics class is given the following facts about the burning out of stars.

1. The burning out of a star can be divided into 3 stages: *helium fusion*, *planetary nebula formation*, and *white dwarf development*.
2. Mid-sized stars fuse hydrogen nuclei (composed of protons) into helium nuclei at their centers, in a process known as helium fusion. These include yellow dwarves, like our Sun, and the slightly smaller orange dwarves. Helium fusion releases a significant amount of kinetic energy.
3. As kinetic energy continues to be released, a planetary nebula may form, in which colorful, ionized gas spreads out from the star's center.
4. The remaining material at the center of the planetary nebula condenses into a white dwarf, which is relatively cool and small in size.
5. Red dwarves are smaller stars that can also carry out helium fusion. These stars can develop into white dwarves sooner than yellow and orange dwarves, and they do not form planetary nebulas.

Two students discuss the eventual fate of three stars in the Alpha Centauri system. Alpha Centauri A, a 1.10-solar-mass yellow dwarf star, where one *solar mass* unit is equivalent to the mass of the Sun; Alpha Centauri B, a 0.91-solar-mass orange dwarf star; and Alpha Centauri C, a 0.12-solar-mass red dwarf star. Alpha Centauri A and B comprise a binary star system that revolves around a common center of mass, while Alpha Centauri C revolves around a nearby center of mass.

Student 1

The 3 stars of the Alpha Centauri system all formed at the same time from the same collection of matter. Alpha Centauri C was initially the most massive of the three stars, and Alpha Centauri A and Alpha Centauri B had the same size. The large Alpha Centauri C had more helium fusion than the other two stars, so it quickly became the smallest of the stars. More of its matter flowed to Alpha Centauri A than to Alpha Centauri B, making Alpha Centauri A slightly larger than Alpha Centauri B.

Student 2

Alpha Centauri A and Alpha Centauri B formed at a different time than Alpha Centauri C. Alpha Centauri A and Alpha Centauri B formed at the same time from a common collection of matter, and Alpha Centauri A was initially more massive than Alpha Centauri B. Alpha Centauri C formed later from a different, smaller collection of matter and never became bigger than a red dwarf. At some point, the small Alpha Centauri C was attracted to the other two stars, resulting in a triple star system.

24. Based on Student 2's discussion, Alpha Centauri C is part of the Alpha Centauri system because of which of the following forces exerted on Alpha Centauri C by the original binary star system?
 - F. Electromagnetism
 - G. Gravitation
 - H. Strong nuclear interaction
 - J. Weak nuclear interaction
25. Based on Student 1's discussion and Fact 2, while matter flowed between Alpha Centauri C and Alpha Centauri A, Alpha Centauri C released most of its energy by fusing:
 - A. helium nuclei into hydrogen nuclei at its core.
 - B. hydrogen nuclei into helium nuclei at its core.
 - C. helium nuclei into hydrogen nuclei at its periphery.
 - D. hydrogen nuclei into helium nuclei at its periphery.
26. Suppose that stars that form from the same collection of matter have similar chemical composition, but stars that form from different collections of matter have different chemical compositions. Student 2 would most likely agree with which of the following statements comparing chemical compositions of the stars in the current Alpha Centauri system at the time that they were formed?
 - F. Alpha Centauri A and Alpha Centauri B had the most similar compositions.
 - G. Alpha Centauri A and Alpha Centauri C had the most similar compositions.
 - H. Alpha Centauri B and Alpha Centauri C had the most similar compositions.
 - J. Alpha Centauri A, Alpha Centauri B, and Alpha Centauri C all had the same compositions.
27. If the mass of the Sun is 2.0×10^{30} g, what is the mass of Alpha Centauri A ?
 - A. 1.8×10^{30} g
 - B. 2.0×10^{30} g
 - C. 2.2×10^{30} g
 - D. 2.4×10^{32} g
28. Which of the following statements best explains why the process described in Fact 2 requires a high initial temperature and pressure?
 - F. All electrons are negatively charged, and like charges attract each other.
 - G. All electrons are negatively charged, and like charges repel each other.
 - H. All protons are positively charged, and like charges attract each other.
 - J. All protons are positively charged, and like charges repel each other.



29. Based on Fact 5 and Student 1's discussion, which of the 3 stars in the Alpha Centauri system, if any, is most likely to develop into a white dwarf?
- A. Alpha Centauri A
 - B. Alpha Centauri B
 - C. Alpha Centauri C
 - D. The three stars will likely develop into white dwarves at the same time.
30. Based on Fact 5, would Student 2 agree that by the time Alpha Centauri B develops into a white dwarf, it will have spent as much time as a mid-sized star as Alpha Centauri A ?
- F. Yes, because according to Student 2, Alpha Centauri A has always been less massive than Alpha Centauri B.
 - G. Yes, because according to Student 2, Alpha Centauri A has always been more massive than Alpha Centauri B.
 - H. No, because according to Student 2, Alpha Centauri A has always been less massive than Alpha Centauri B.
 - J. No, because according to Student 2, Alpha Centauri A has always been more massive than Alpha Centauri B.

Passage VI

Three experiments were conducted using the gases nitrogen (N_2), nitrogen dioxide (NO_2), and xenon (Xe). For each gas:

1. A cap was placed on a 2 L metal chamber, containing sensors to measure temperature and pressure and a valve to allow gas to enter.
2. Air was pumped out of the chamber until the pressure inside was measured to be 0.00 mmHg.
3. The chamber was placed on an analytical balance, which was then reset to 0.00 g.
4. Some of the gas was added to the chamber.
5. When the gas in the vessel reached room temperature (298 K), the mass and pressure inside were recorded.
6. Steps 4 and 5 were repeated for different masses.

The experiments were repeated using a 4 L metal chamber (see Figures 1 and 2).

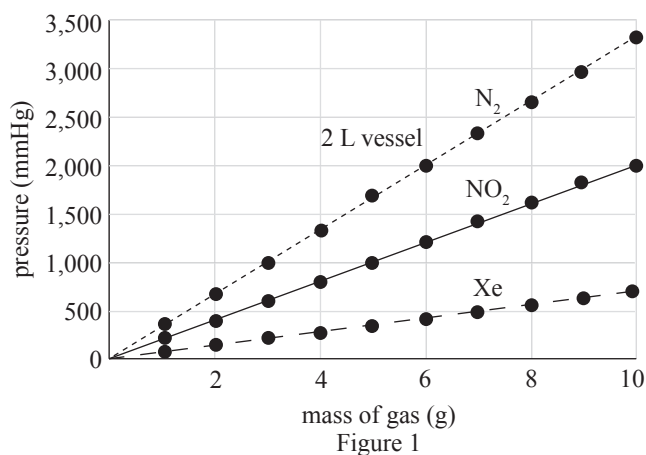


Figure 1

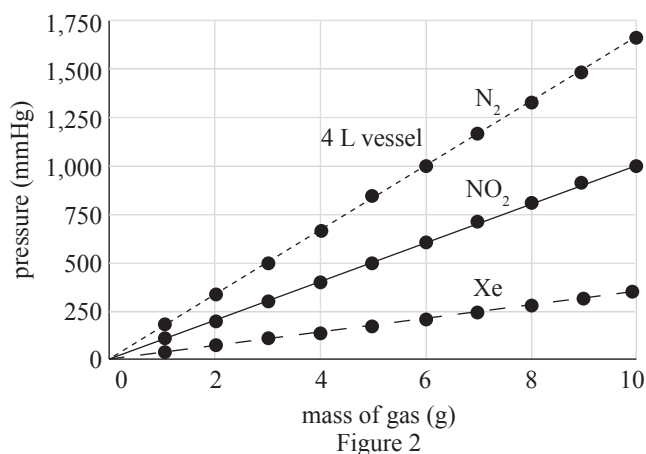


Figure 2

31. Based on Figure 2, if 12 g of Xe had been added to the 4 L vessel, the pressure would have been:

A. less than 300 mmHg.
 B. between 300 and 600 mmHg.
 C. between 600 mmHg and 900 mmHg.
 D. greater than 1,200 mmHg.

32. Suppose the experiments had been repeated, except with a 3 L vessel. Based on Figures 1 and 2, the pressure exerted by 10 g of NO_2 would most likely have been:

F. less than 1,000 mmHg.
 G. between 1,000 and 2,000 mmHg.
 H. between 2,000 and 2,500 mmHg.
 J. greater than 2,500 mmHg.

33. Based on Figures 1 and 2, for a given mass of N_2 at 298 K, how does the pressure exerted by the N_2 in a 4 L vessel compare to the pressure exerted by the N_2 in a 2 L vessel? In the 4 L vessel, the N_2 pressure will be:

A. half as great as in the 2 L vessel.
 B. the same as in the 2 L vessel.
 C. twice as great as in the 2 L vessel.
 D. 4 times as great as in the 2 L vessel.



34. Which of the following best explains why equal masses of N_2 and NO_2 at the same temperature and in vessels of similar sizes had different pressures? The pressure exerted by the N_2 was:
- F. greater, because there were fewer N_2 molecules per gram than there were NO_2 molecules per gram.
 - G. greater, because there were more N_2 molecules per gram than there were NO_2 molecules per gram.
 - H. less, because there were fewer N_2 molecules per gram than there were NO_2 molecules per gram.
 - J. less, because there were more N_2 molecules per gram than there were NO_2 molecules per gram.
35. Suppose the experiment involving N_2 and the 4 L vessel had been repeated, except at a temperature of 287 K. For a given mass of N_2 , compared to the pressure measured in the original experiment, the pressure measured at 287 K would have been:
- A. greater, because pressure is directly proportional to temperature.
 - B. greater, because pressure is inversely proportional to temperature.
 - C. less, because pressure is directly proportional to temperature.
 - D. less, because pressure is inversely proportional to temperature.

Passage VII

The *absolute threshold pressure for hearing* is the minimum air pressure at each audio frequency that can produce a sound that is detectable by the human ear. The *pain threshold pressure for hearing* is the maximum air pressure at each frequency that the human ear can withstand without sensing pain.

Figure 1 below displays the absolute and pain threshold pressures for hearing in two media: air and water. The figure also shows P , the percentage increase in compression of the air or water with increasing sound pressure. Audio frequency is given in cycles per second (cyc/sec), and sound pressure level is given in decibels (db).

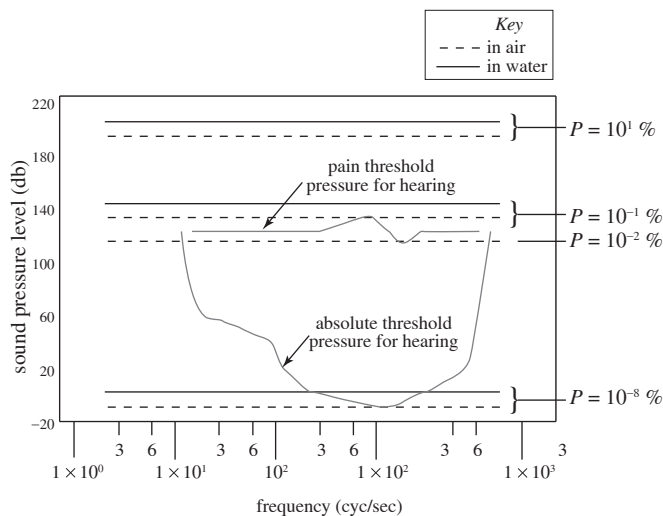


Figure 1

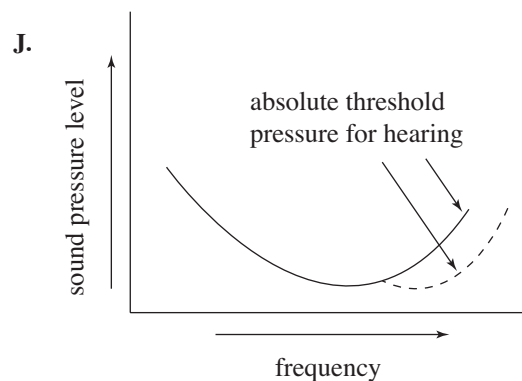
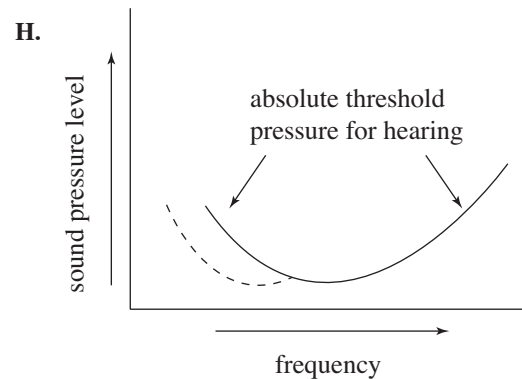
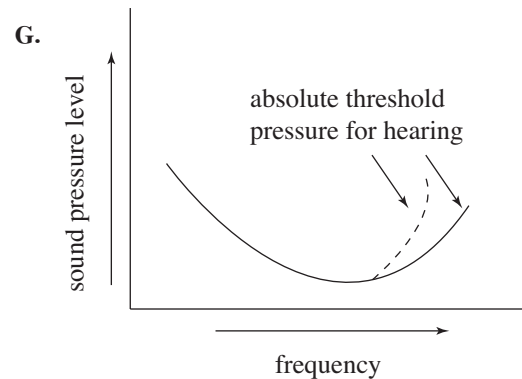
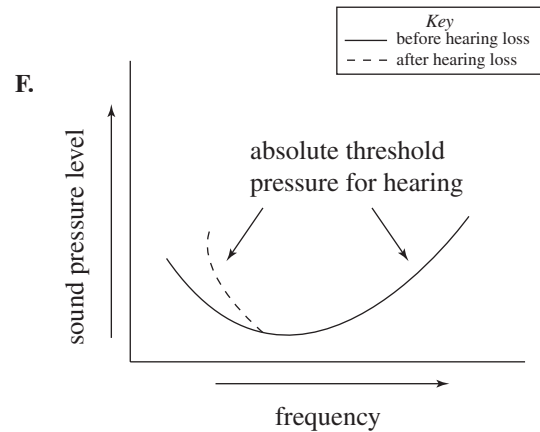
36. According to Figure 1, which of the following is the closest to the highest frequency that can be heard by a human being?

- F. 1 cyc/sec
- G. 10 cyc/sec
- H. 100 cyc/sec
- J. 1,000 cyc/sec

37. Based on Figure 1, a sound of a given frequency will have the highest sound level pressure for which of the following sets of conditions?

- | | Sound in | P |
|----|----------|-------------|
| A. | Air | $10^{-8}\%$ |
| B. | Air | $10^{-1}\%$ |
| C. | Water | $10^{-8}\%$ |
| D. | Water | $10^{-1}\%$ |

38. As humans grow older, there is often a loss in the ability to hear sounds at high frequencies. Which of the following figures best illustrates this?





39. A scientist developed a hypothesis that sounds with any sound pressure level would be painful to humans if the frequency were 10^4 cyc/sec. Does the data from Figure 1 support this hypothesis?
- A. No, because humans are unable to hear sounds over 10^4 cyc/sec.
 - B. No, because the absolute threshold of pain for hearing is relatively constant with changes in frequency.
 - C. Yes, because the absolute threshold of pain for hearing is relatively constant with changes in frequency.
 - D. Yes, because as frequency increases above 10^4 cyc/sec, the absolute threshold of pain for hearing also increases.
40. Based on Figure 1, does P depend on the frequency of sound at a given sound pressure level?
- F. No, because as frequency increases, P increases.
 - G. No, because as frequency increases, P remains constant.
 - H. Yes, because as frequency increases, P increases.
 - J. Yes, because as frequency increases, P remains constant.

SCORE YOUR PRACTICE TEST

Step A

Count the number of correct answers: _____. This is your *raw score*.

Step B

Use the score conversion table below to look up your raw score. The number to the left is your *scale score*: _____.

Science Scale Conversion Table

Scale Score	Raw Score	Scale Score	Raw Score	Scale Score	Raw Score
36	40	27	32	18	16–17
35	39	26	30–31	17	15
34	--	25	28–29	16	14
33	38	24	26–27	15	13
32	37	23	25	14	12
31	--	22	23–24	13	11
30	36	21	21–22	12	10
29	35	20	19–20	11	9
28	33–34	19	18	10	7–8

Step
A

Step
B