STAAR®

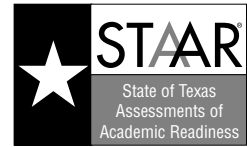**State of Texas
Assessments of
Academic Readiness**

GRADE 8
Science

Administered April 2014

RELEASED

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

FORMULAS

Density = $\dfrac{\text{mass}}{\text{volume}}$
$$D = \frac{m}{V}$$

Average speed = $\dfrac{\text{total distance}}{\text{total time}}$
$$s = \frac{d}{t}$$

Net force = (mass)(acceleration)
$$F = ma$$

Work = (force)(distance)
$$W = Fd$$

STAAR GRADE 8 SCIENCE
REFERENCE MATERIALS

PERIODIC TABLE OF THE ELEMENTS

Key:
- Atomic number — 14
- Symbol — **Si**
- Atomic mass — 28.086
- Name — Silicon

Group																	
1 / 1A																	**18 / 8A**

1 **H** 1.008 Hydrogen	2 2A											13 3A	14 4A	15 5A	16 6A	17 7A	2 **He** 4.003 Helium
3 **Li** 6.941 Lithium	4 **Be** 9.012 Beryllium											5 **B** 10.812 Boron	6 **C** 12.011 Carbon	7 **N** 14.007 Nitrogen	8 **O** 15.999 Oxygen	9 **F** 18.998 Fluorine	10 **Ne** 20.180 Neon
11 **Na** 22.990 Sodium	12 **Mg** 24.305 Magnesium	3 3B	4 4B	5 5B	6 6B	7 7B	8	9 8B	10	11 1B	12 2B	13 **Al** 26.982 Aluminum	14 **Si** 28.086 Silicon	15 **P** 30.974 Phosphorus	16 **S** 32.066 Sulfur	17 **Cl** 35.453 Chlorine	18 **Ar** 39.948 Argon
19 **K** 39.098 Potassium	20 **Ca** 40.078 Calcium	21 **Sc** 44.956 Scandium	22 **Ti** 47.867 Titanium	23 **V** 50.942 Vanadium	24 **Cr** 51.996 Chromium	25 **Mn** 54.938 Manganese	26 **Fe** 55.845 Iron	27 **Co** 58.933 Cobalt	28 **Ni** 58.693 Nickel	29 **Cu** 63.546 Copper	30 **Zn** 65.38 Zinc	31 **Ga** 69.723 Gallium	32 **Ge** 72.64 Germanium	33 **As** 74.922 Arsenic	34 **Se** 78.96 Selenium	35 **Br** 79.904 Bromine	36 **Kr** 83.798 Krypton
37 **Rb** 85.468 Rubidium	38 **Sr** 87.62 Strontium	39 **Y** 88.906 Yttrium	40 **Zr** 91.224 Zirconium	41 **Nb** 92.906 Niobium	42 **Mo** 95.96 Molybdenum	43 **Tc** (98) Technetium	44 **Ru** 101.07 Ruthenium	45 **Rh** 102.906 Rhodium	46 **Pd** 106.42 Palladium	47 **Ag** 107.868 Silver	48 **Cd** 112.412 Cadmium	49 **In** 114.818 Indium	50 **Sn** 118.711 Tin	51 **Sb** 121.760 Antimony	52 **Te** 127.60 Tellurium	53 **I** 126.904 Iodine	54 **Xe** 131.294 Xenon
55 **Cs** 132.905 Cesium	56 **Ba** 137.328 Barium	71 **Lu** 174.967 Lutetium	72 **Hf** 178.49 Hafnium	73 **Ta** 180.948 Tantalum	74 **W** 183.84 Tungsten	75 **Re** 186.207 Rhenium	76 **Os** 190.23 Osmium	77 **Ir** 192.217 Iridium	78 **Pt** 195.085 Platinum	79 **Au** 196.967 Gold	80 **Hg** 200.59 Mercury	81 **Tl** 204.383 Thallium	82 **Pb** 207.2 Lead	83 **Bi** 208.980 Bismuth	84 **Po** (209) Polonium	85 **At** (210) Astatine	86 **Rn** (222) Radon
87 **Fr** (223) Francium	88 **Ra** (226) Radium	103 **Lr** (262) Lawrencium	104 **Rf** (267) Rutherfordium	105 **Db** (268) Dubnium	106 **Sg** (271) Seaborgium	107 **Bh** (272) Bohrium	108 **Hs** (270) Hassium	109 **Mt** (276) Meitnerium	110 **Ds** (281) Darmstadtium	111 **Rg** (280) Roentgenium							

Mass numbers in parentheses are those of the most stable or most common isotope.

Lanthanide Series

57 **La** 138.905 Lanthanum	58 **Ce** 140.116 Cerium	59 **Pr** 140.908 Praseodymium	60 **Nd** 144.242 Neodymium	61 **Pm** (145) Promethium	62 **Sm** 150.36 Samarium	63 **Eu** 151.964 Europium	64 **Gd** 157.25 Gadolinium	65 **Tb** 158.925 Terbium	66 **Dy** 162.500 Dysprosium	67 **Ho** 164.930 Holmium	68 **Er** 167.259 Erbium	69 **Tm** 168.934 Thulium	70 **Yb** 173.055 Ytterbium

Actinide Series

89 **Ac** (227) Actinium	90 **Th** 232.038 Thorium	91 **Pa** 231.036 Protactinium	92 **U** 238.029 Uranium	93 **Np** (237) Neptunium	94 **Pu** (244) Plutonium	95 **Am** (243) Americium	96 **Cm** (247) Curium	97 **Bk** (247) Berkelium	98 **Cf** (251) Californium	99 **Es** (252) Einsteinium	100 **Fm** (257) Fermium	101 **Md** (258) Mendelevium	102 **No** (259) Nobelium

Updated Spring 2011

SCIENCE

Read each question carefully. For a multiple-choice question, determine the best answer to the question from the four answer choices provided. For a griddable question, determine the best answer to the question. Then fill in the answer on your answer document.

1 A student lets a toy car roll four times down a ramp that is 1 m long. Each time the student covers the surface of the ramp with a different material. The student measures the time it takes the car to roll down the ramp and records the results in the table below.

Material	Time to Complete Ramp (s)
W	4
X	8
Y	7
Z	5

Which of these would be the best conclusion based on the data in the table?

A Different surfaces affect how fast a toy car accelerates.

B Different toy cars travel at different speeds.

C Gravity has little effect on the speed of toy cars on different surfaces.

D Air resistance is the greatest factor in limiting the acceleration of different toy cars.

2   The diagram below models Mercury and Venus orbiting the sun.

Orbits of Mercury and Venus
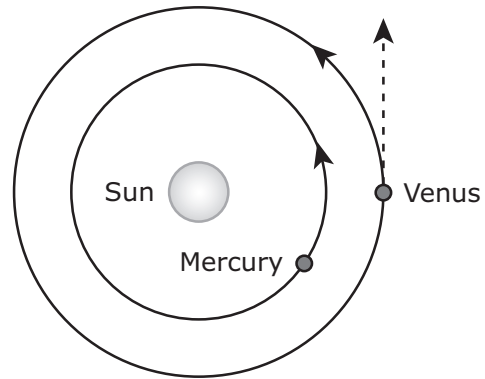
What force causes Venus to travel along a curved path instead of moving in a straight line as indicated by the dashed line in the diagram?

F   Electromagnetic attraction between the sun and Venus

G   Gravitational attraction between the sun and Venus

H   Electromagnetic attraction between Mercury and Venus

J   Gravitational attraction between Mercury and Venus

3 Before the Industrial Revolution in England, the peppered moth was commonly found on tree trunks that had light-colored lichen on the bark. Most of the peppered moths were a light gray-brown color similar to that of the lichen. A few of the moths had a mutation that made them a dark gray-brown color.
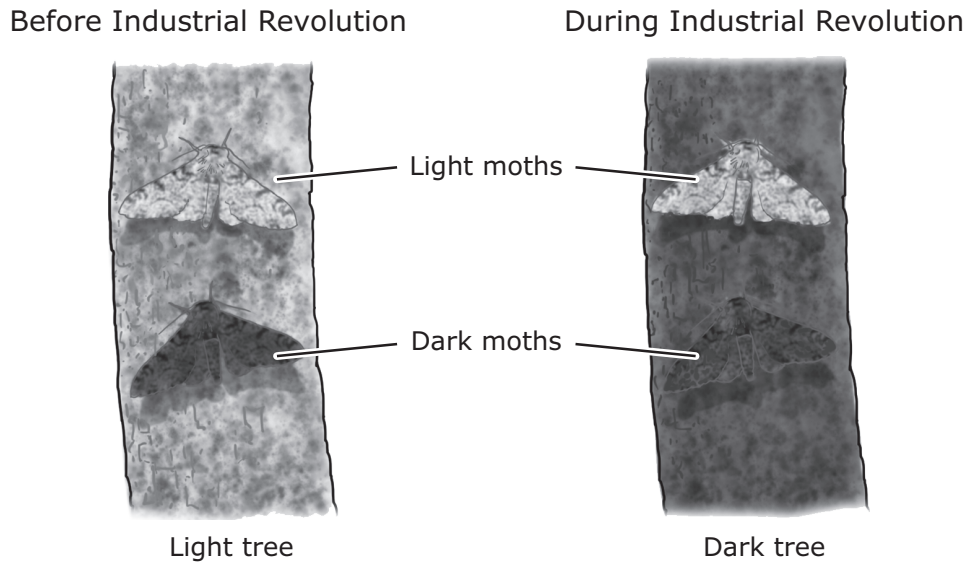
Before Industrial Revolution   During Industrial Revolution

Light moths

Dark moths

Light tree   Dark tree

During the Industrial Revolution, coal-burning factories produced black soot that covered the trees and killed the lichen in and near cities. In these areas the number of dark peppered moths increased, while the number of light peppered moths decreased. What contributed to this change?

A The soot-covered trees camouflaged the dark moths.

B The dark moths preyed on the light moths.

C Bird populations increased in the areas near the factories.

D The dark moths laid fewer eggs than the light moths.

4 Four students were asked to classify the activities of the people in the picture below as examples of either potential or kinetic energy.
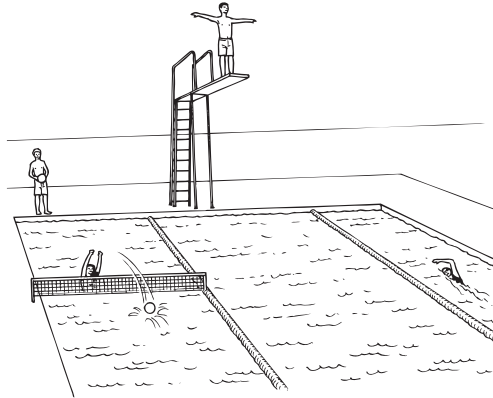
Which student correctly classified the activities?

Student 1

F

Activity Observed	Classification of Activity
Girl swimming laps	Potential energy
Boy on diving board	Kinetic energy
Girl hitting volleyball	Potential energy
Boy holding volleyball	Kinetic energy

Student 3

H

Activity Observed	Classification of Activity
Girl swimming laps	Kinetic energy
Boy on diving board	Kinetic energy
Girl hitting volleyball	Potential energy
Boy holding volleyball	Potential energy

Student 2

G

Activity Observed	Classification of Activity
Girl swimming laps	Potential energy
Boy on diving board	Potential energy
Girl hitting volleyball	Kinetic energy
Boy holding volleyball	Kinetic energy

Student 4

J

| Activity Observed	Classification of Activity
Girl swimming laps	Kinetic energy
Boy on diving board	Potential energy
Girl hitting volleyball	Kinetic energy
Boy holding volleyball	Potential energy

5 The Prairies Region and the Cross Timbers are located in north-central Texas. The graph below shows information about eating habits of white-tailed deer in these regions.

Typical Diet of White-Tailed Deer
in the Prairies Region and the Cross Timbers of Texas

Feed 5%

Crops 7%

Grass 12%

Shrubs, vines 36%

Seeds, fruit 20%

Weeds 20%
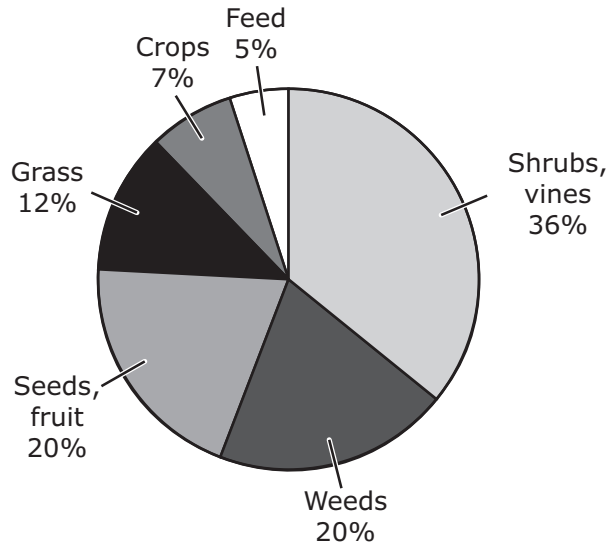
Source: Texas Parks and Wildlife Department

A Cross Timbers rancher is concerned about competition between the ranch animals and the deer. Based on the graph, which ranch animals compete for the most food with white-tailed deer?

A Cattle that eat grass and feed

B Goats that eat weeds and shrubs

C Turkeys that eat seeds and fruit

D Hogs that eat fruit, seeds, and feed

---

6 Many processes occur in the digestive system. Which process is best classified as a physical change?

F Saliva converting the starch molecules in crackers into simple sugars

G Digestive enzymes breaking down proteins into smaller fragments

H Bacteria converting lactose into simple sugars in the intestines

**J** Teeth grinding an almond into smaller pieces in the mouth

GO ON

7 When Charles Darwin visited the Galápagos Islands in the 1800s, he observed many types of organisms that were similar but lived on different islands. The four species of mockingbirds found on the Galápagos Islands are shown below. Each species lives on a different island.

Galápagos mockingbird

Chatham mockingbird

Hood mockingbird

Charles mockingbird
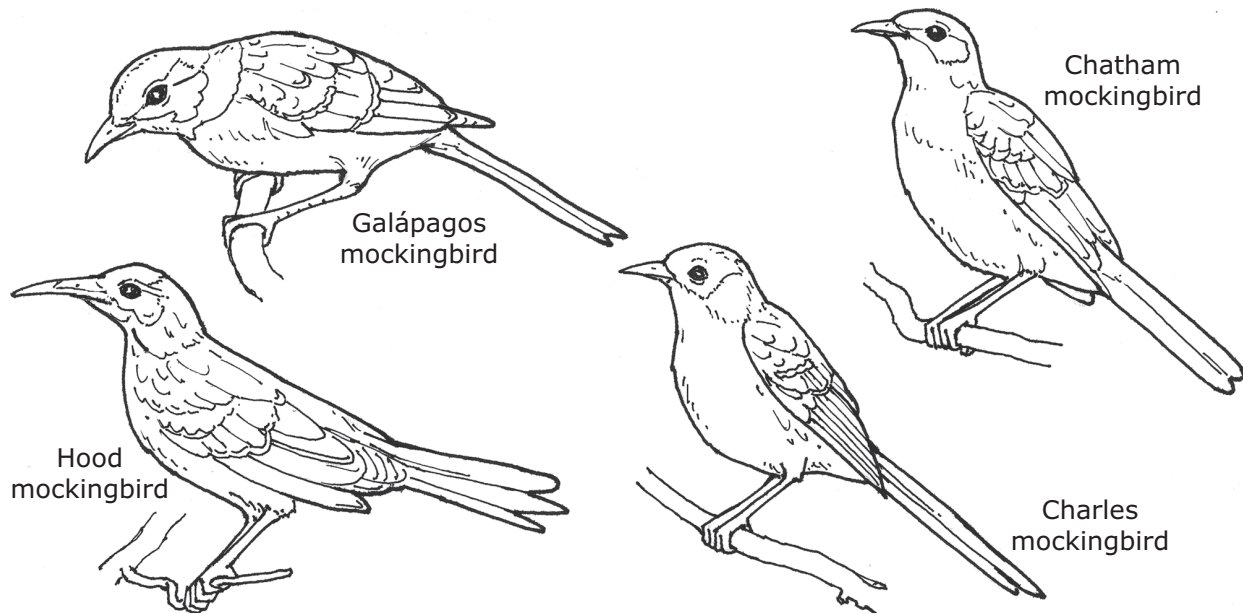
These species are very similar, but the Hood mockingbird has a longer beak than the other three species. Which of the following best explains this difference?

A The Hood mockingbird needs a longer beak for defense against predators.

B The Hood mockingbird originated from a different type of bird than the other species.

C The Hood mockingbird's longer beak is an adaptation to the food available in the bird's habitat.

D The Hood mockingbird's beak stretched to reach its food, and the longer beak was passed down to its offspring.

8 A Hertzsprung-Russell diagram is shown below.

Hertzsprung-Russell Diagram
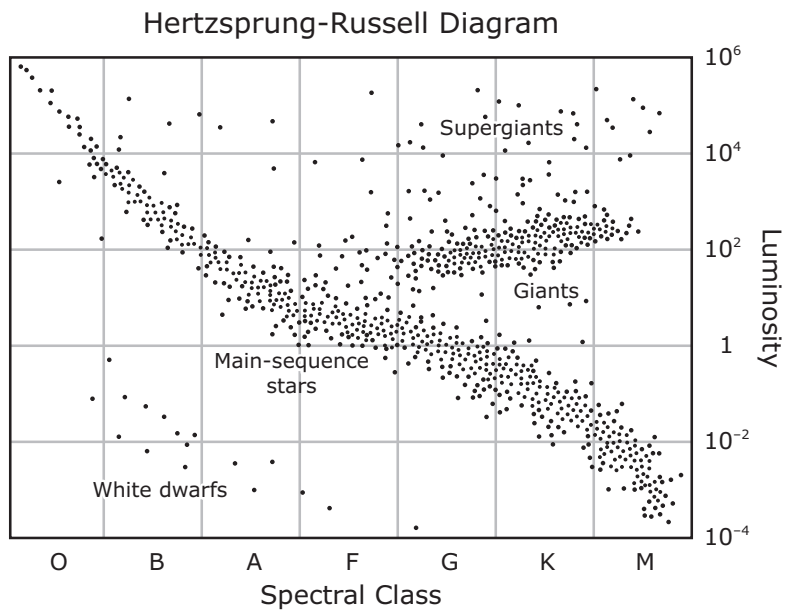
Based on this diagram, which type of stars would belong to spectral class M and have the highest luminosity?

F Main-sequence stars

G Giants

H White dwarfs

J Supergiants

9 When a lion eats a zebra and then uses the energy from the zebra to run, the lion's body converts —

    A chemical energy to mechanical energy

    B electrical energy to chemical energy

    C chemical energy to light energy

    D mechanical energy to chemical energy

---

10 Some students in a chemistry lab conducted an investigation in which they added four different solid substances to separate beakers of water. They stirred the mixtures for one minute and then recorded their observations in the table below.

Student Observations

Substance	Observation
1	The substance dissolved.
2	The substance caused bubbles to form.
3	The substance sank to the bottom.
4	The substance floated on top.

Which substance most likely caused a new substance to be formed when mixed with water?

    F Substance 1

    G Substance 2

    H Substance 3

    J Substance 4

11 Which of these correctly describes a relationship between organisms in the soil food web below?
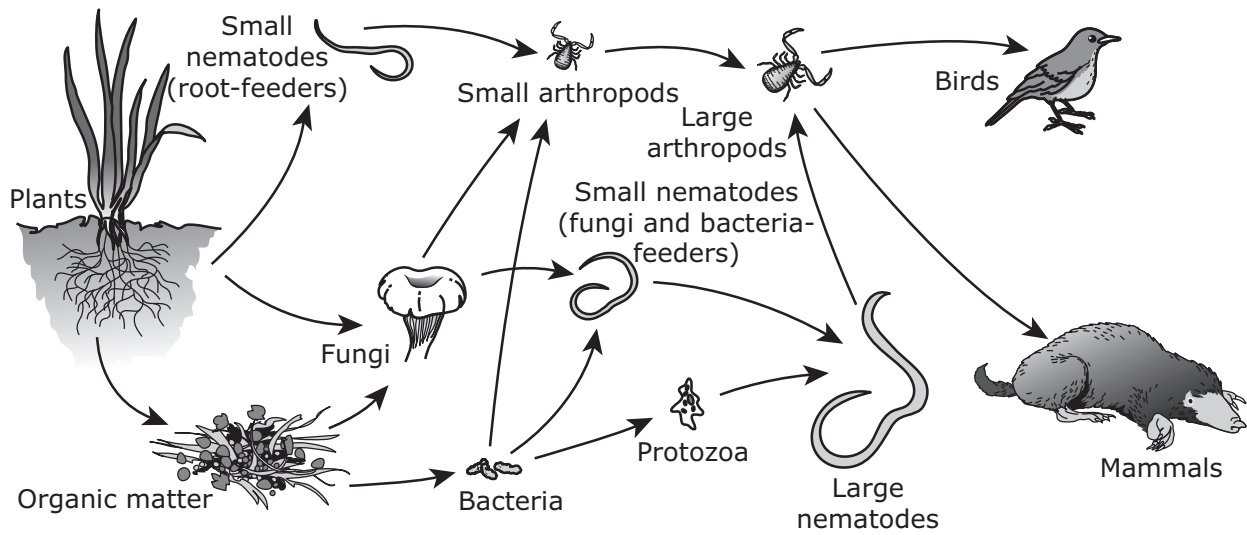
A Protozoa get nutrients from small arthropods.

B Mammals are predators of birds.

C Nematodes prey on arthropods.

D Bacteria get nutrients from organic matter.

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12 Scientists recently discovered that rocks collected from the Franklin Mountains in West Texas and rocks collected from mountains in eastern Antarctica were exactly the same age. Further research showed that the rocks were chemically and geologically the same and came from the same magma source. This discovery provides evidence of —

F coastal erosion

G plate tectonics

H ocean currents

J glacial melting

Page 14

13 Galveston Bay, an estuary in Southeast Texas, is shown below. The amount of salt in the water changes with the tides. Sometimes the water is mostly freshwater, and sometimes it is mixed with saltwater. Various plant species live in this environment and provide a habitat for other organisms.
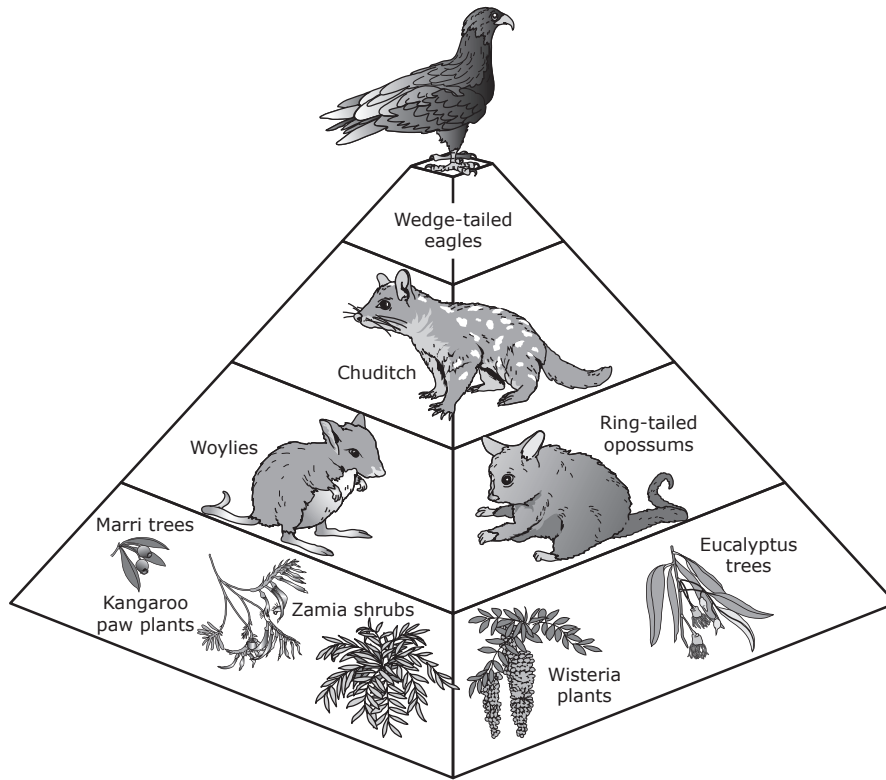

Estuary plants

To successfully live in an estuary, a plant species must have an adaptation that allows it to —

A   produce large amounts of food

B   absorb large amounts of water

**C**   store excess gases

D   filter excess salt

14 The flow of energy in some Australian food chains is modeled in the energy pyramid below.

Based on the model, which consumers would receive the greatest amount of energy captured by the producers in their food chains?

F Wedge-tailed eagles

G Chuditch

H Ring-tailed opossums

J Eucalyptus trees

15 The satellite image below shows a ship channel between South Padre Island and Boca Chica beach in South Texas.

Ship channel

© GeoEye
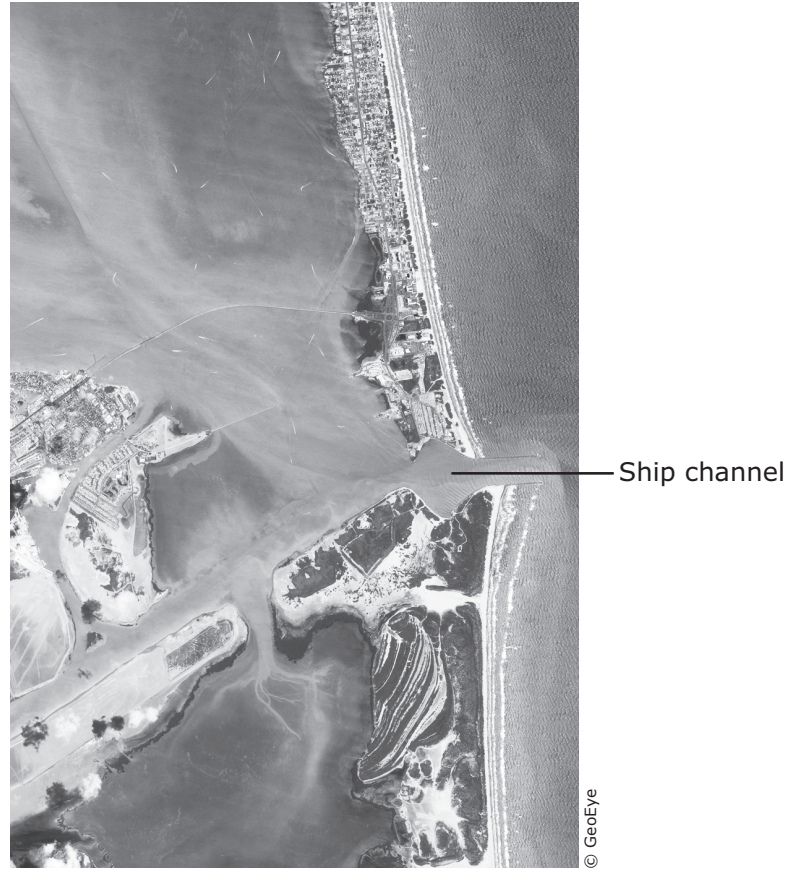
Sand is sometimes removed from the ship channel through a process called dredging to make it easier for ships to travel through. Recently sand from the bottom of the channel was moved to area beaches. Without this transfer of sand, what would most likely occur in this area in the future?

A The ship channel would become deeper, and the island would move west toward the mainland.

B The ship channel would become shallower, and the beach would become narrower.

C The ship channel would become narrower, and the island would become completely covered with water.

D The ship channel would become wider, and the island would sink into the Gulf of Mexico.

16 A student is studying calcium, a highly reactive element that humans need for strong bones. Which characteristic of calcium is most closely related to its chemical reactivity?

    F The 20 protons in each atom of calcium

    G The density of calcium, which is 1.54 g/cm^3

    H The atomic mass of calcium, which is 40.078 amu

    J The 2 valence electrons in each atom of calcium

---

17 When a space shuttle was launched, the astronauts onboard experienced an acceleration of 29.0 m/s^2. If one of the astronauts had a mass of 60.0 kg, what net force in newtons did the astronaut experience?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

18 A scientist named Joseph Connell studied two species of barnacles on the shore of a Scottish island. In the area between the average tide and the neap high tide, he found that the population of Species A was smaller than that of Species B. He removed Species B from one area but left both Species A and B in a similar area. The graph below shows the results of this study.
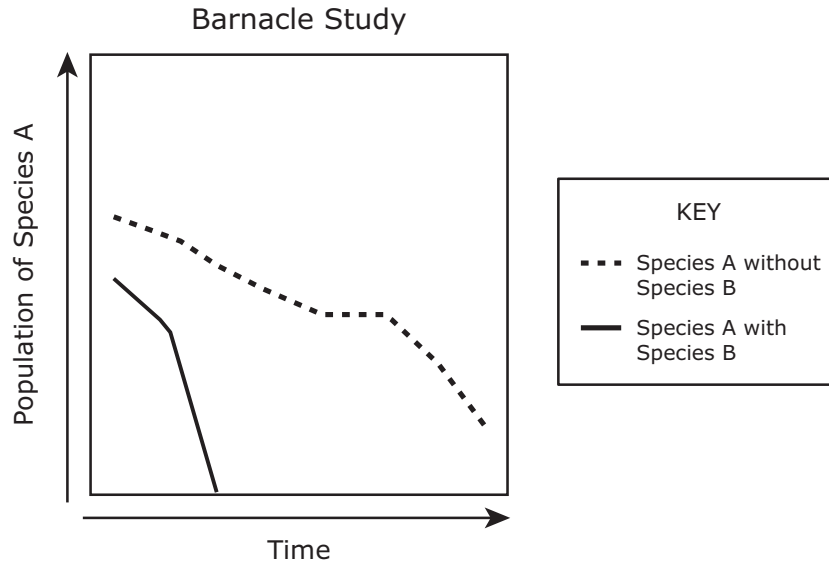
Barnacle Study

Based on these data, which hypothesis was Connell most likely testing?

F The populations of both species of barnacles increase more in warm water than in cool water.

G Barnacles grow larger when they are isolated from other species.

H The two species of barnacles compete with each other for resources.

**J** The two species of barnacles are closely related to each other.

19 A model of a beryllium atom is shown below.
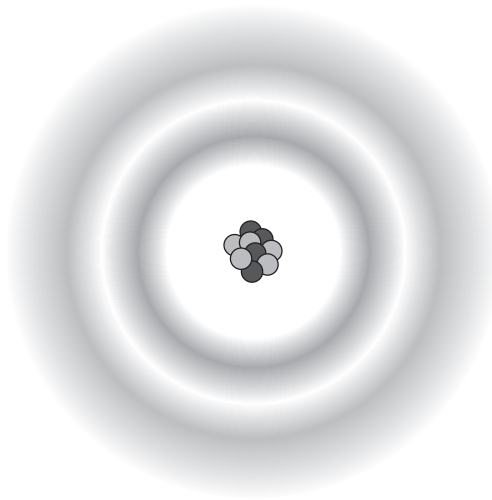
What types of particles are found in the cloud surrounding the atom's nucleus?

A Positively charged particles and negatively charged particles

B Negatively charged particles only

C Neutral particles and positively charged particles

D Positively charged particles only

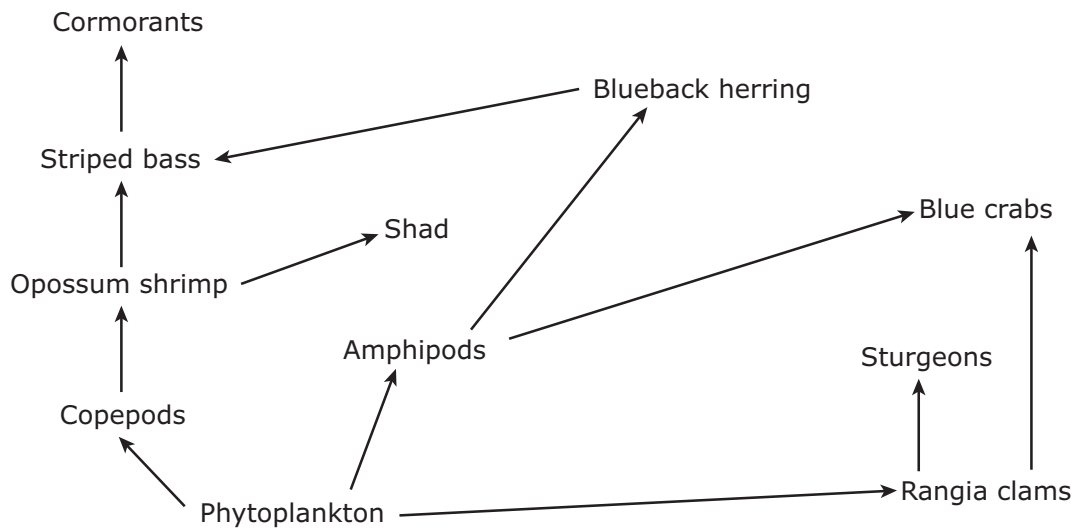**20** A student draws the model shown below.
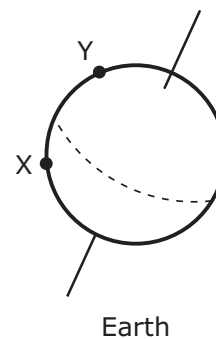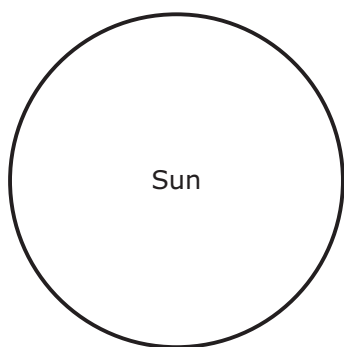
Which of these best compares the conditions at Location X and Location Y?

F It is day at Location X and night at Location Y.

G It is winter at Location X and summer at Location Y.

H There are more hours of daylight at Location X than at Location Y.

J The moon is brighter when viewed from Location X than when viewed from Location Y.

**21** Based on its chemical formula, which of the following substances is an organic compound?

A Urea, CH_4N_2O

B Ammonium sulfide, $(NH_4)_2S$

C Silane, SiH_4

D Sodium chloride, NaCl

Page 21

GO ON

22 In the aquatic food web below, which two organisms have a predator-prey relationship?

Cormorants

Blueback herring

Striped bass

Shad

Blue crabs

Opossum shrimp

Amphipods

Sturgeons

Copepods

Phytoplankton

Rangia clams

F Shad and sturgeons

G Sturgeons and blue crabs

H Blue crabs and rangia clams

J Copepods and amphipods

Page 22

23 The graph below shows distance over time.
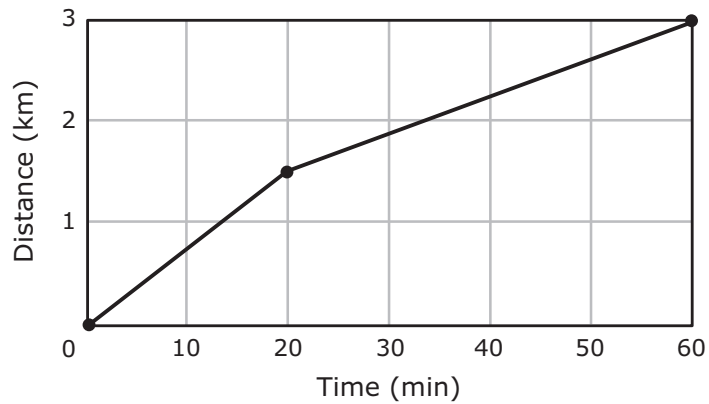
Which of these situations could be represented by this graph?

A A student walks 1.5 km to a friend's house in 40 minutes. The two students then walk another 1.5 km to school in 20 minutes.

B A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 40 minutes.

C A student walks 1.5 km to a friend's house in 30 minutes. The two students then walk another 1.5 km to school in 30 minutes.

D A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 60 minutes.

24 Some students used records from the U.S. Naval Observatory to make the table below of the percent of the moon that was visible on each night in January 2011.

Percent of Moon Visible in January 2011

Date	Moon Visible (%)	Date	Moon Visible (%)	Date	Moon Visible (%)
1	11	11	38	21	97
2	5	12	48	22	92
3	1	13	57	23	85
4	0	14	67	24	76
5	1	15	76	25	65
6	3	16	84	26	54
7	8	17	91	27	43
8	14	18	96	28	32
9	21	19	99	29	23
10	29	20	100	30	15
				31	8

Source: U.S. Naval Observatory

Based on these data, what part of the lunar cycle occurred between January 5 and January 7?

F Waxing crescent moon

G Waning crescent moon

H Full moon

J New moon

25

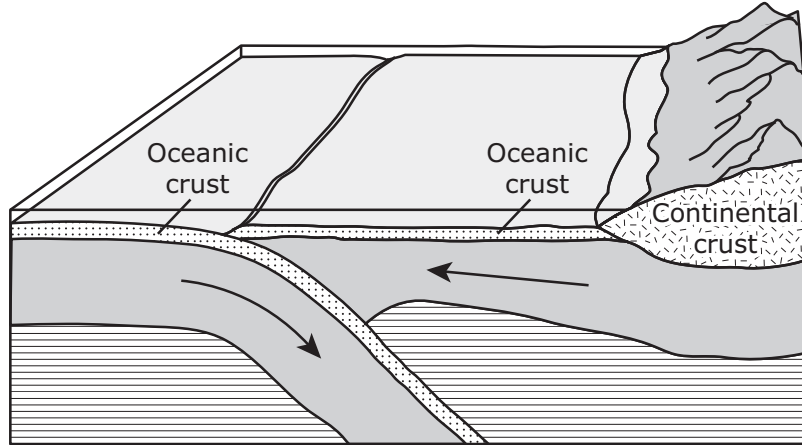$$CaCO_3 \xrightarrow{\text{heat}} CaO + CO_2$$
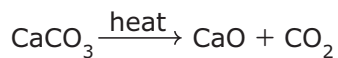
In the chemical reaction shown above, the products are best classified as —

A two elements

B one element and one compound

C two compounds

D two compounds and one element

GO ON

26 The diagram below shows a model of the movement of two tectonic plates. When the plates collide, one plate often moves below the other plate.


The rising magma that can result from this type of plate movement may produce —

F fossil layers

G volcanic islands

H deep-sea sediment

J seafloor spreading

---

27 A student uses a magnet to move a 0.025 kg metal ball. The magnet exerts a force of 5 N, which causes the ball to begin moving. What is the acceleration of the ball when it begins to move?

A 200 m/s^2

B 0.125 m/s^2

C 5 m/s^2

D 5.025 m/s^2

**28** The diagram below shows four positions in Earth's orbit around the sun.
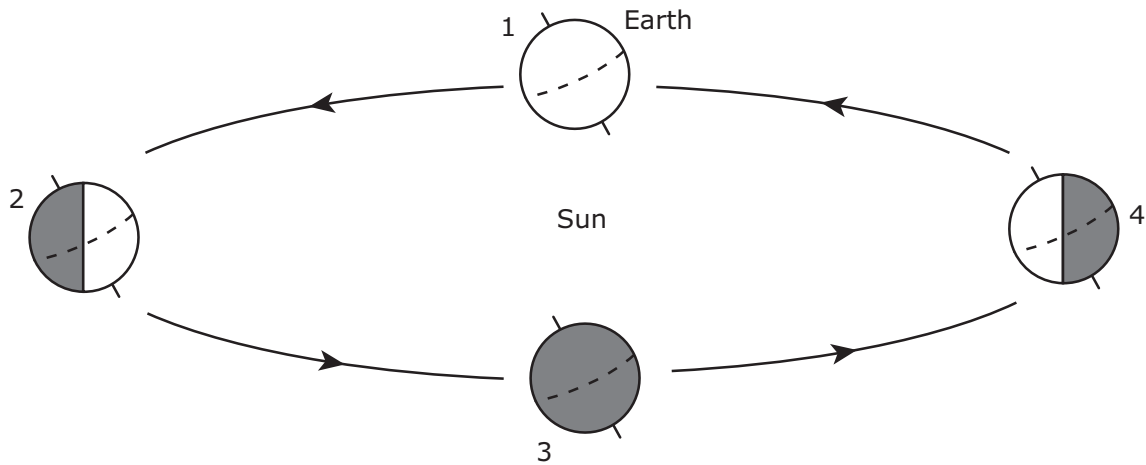
The Northern Hemisphere experiences the beginning of spring when Earth is in —

F Position 1

G Position 2

H Position 3

J Position 4

---

29 When people run long distances, their muscles require increased amounts of oxygen. Which system is responsible for carrying this oxygen to the muscles?

A Nervous

B Respiratory

C Digestive

D Circulatory

30 The points labeled W and Y on the topographic map below show the campsites of two families. Each family hiked to the elevation on the map marked X. The arrows show the paths taken by both families.

Contour interval: 20 m
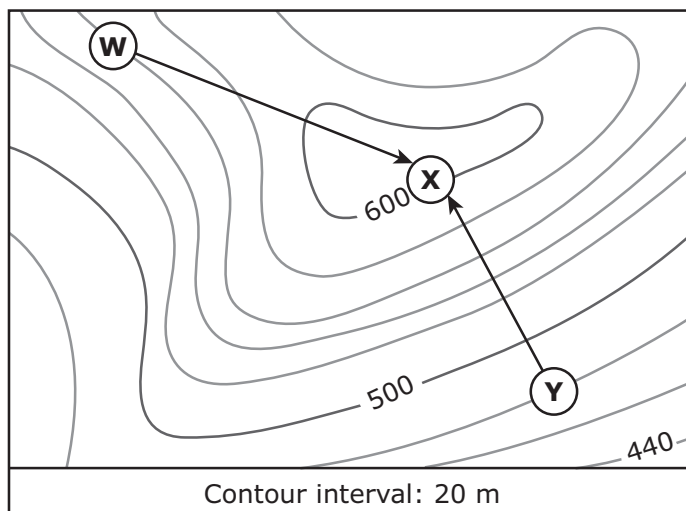
What was the change in elevation, to the nearest ten meters, for the family that took the steepest path to Point X?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

---

31 The chemical formula for sodium sulfate is Na_2SO_4. How many sulfur atoms are in the formula for sodium sulfate?

A   1

B   2

C   6

D   7

32 In 1838 botanist Matthias Schleiden determined that all plants are composed of cells. In 1839 anatomist Theodor Schwann proposed that all animals are composed of cells. In 1855 biologist Rudolph Virchow added to Schleiden's and Schwann's observations and proposed that all living things are composed of cells. Which statement is also part of Virchow's cell theory?

    F All cells have a cell wall.

    G All cells arise from pre-existing cells.

    H All cells are capable of photosynthesis.

    J All cells can develop into any other type of cell.

---

33 What is the mass number of a potassium (K) atom that has 20 neutrons?

    A 18

    B 19

    C 20

    D 39

34 What is the difference between the velocity and the speed of an object?

   F Velocity is the change in distance over time, while speed is the change in velocity over time.

   G Velocity has a direction associated with it, while speed has no specific direction.

   H Velocity has no direction associated with it, while speed has a specific direction.

   **J** Velocity is the change in speed over time, while speed is the change in distance over time.

35 The moon reflects different amounts of sunlight onto Earth at different times. This reflected sunlight is commonly called moonlight. The graph below shows the intensity of moonlight at different times in a lunar cycle.

Intensity of Moonlight
During a Lunar Cycle
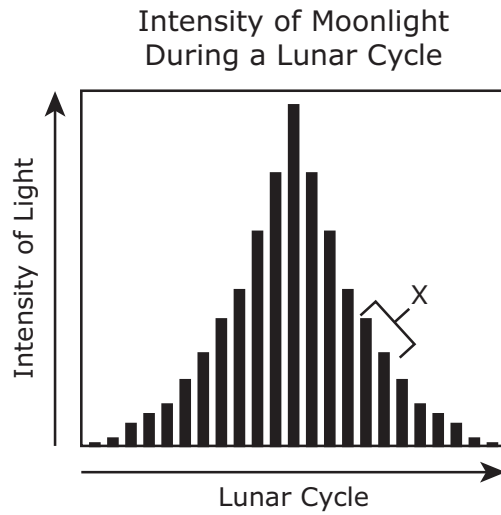
Which moon phase most likely occurs at the time in the cycle represented by an X on the graph?

A

C

B

D
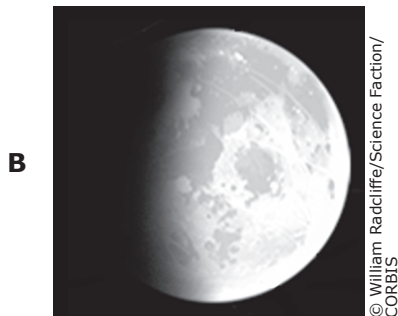
36 Fish in a lake have to compete for space. Different fish have different optimal temperature ranges. The graph below shows the temperature ranges of four fish species.

Optimal Temperature Ranges
of Four Fish Species
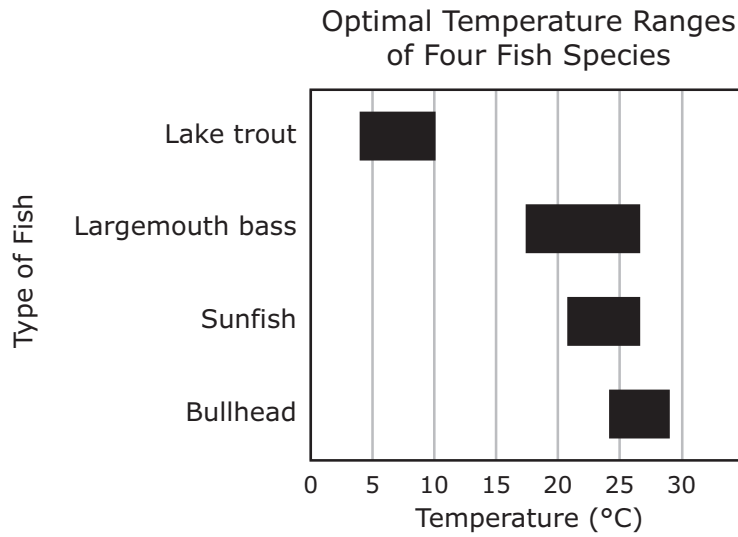
At which temperature range will there be the most competition for space among these fish species?

F 5°C to 10°C

G 10°C to 15°C

H 15°C to 20°C

J 25°C to 30°C

37 Hurricanes and similar storm systems begin over oceans. The map below shows average surface temperatures of the oceans in the summer.

Oceanic Surface Temperatures in Summer

KEY

▓	−0.9°C to 12.7°C
▒	12.8°C to 26.3°C
░	26.4°C to 30.9°C
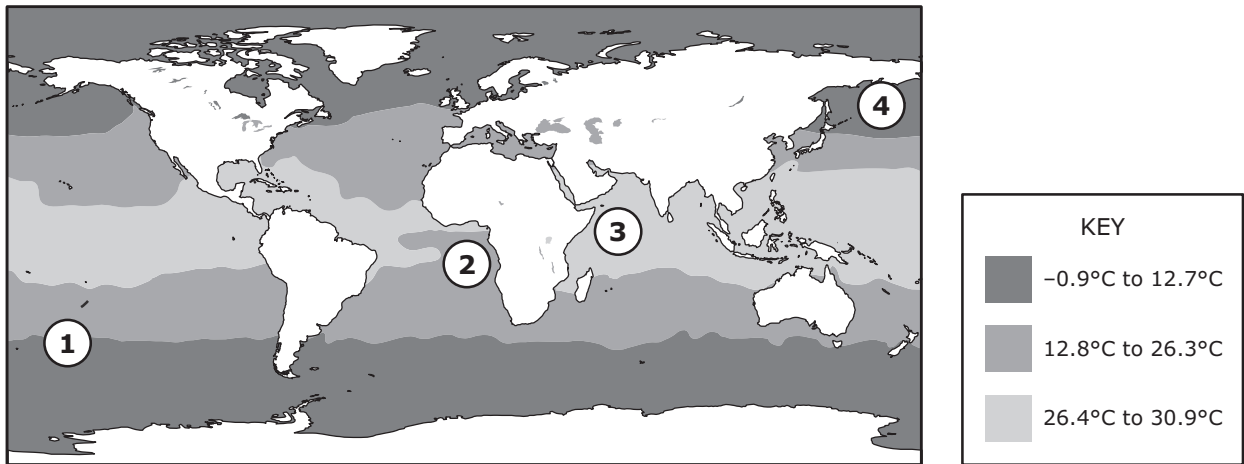
Source: NASA

Based on the map, which area probably produced the most violent storm systems?

A Area 1

B Area 2

C Area 3

D Area 4

GO ON

38 Some students were investigating the speed of a toy car they built. They performed two trials and recorded their data in the table below.

Toy-Car Trials

Trial 1		Trial 2	
Time (s)	Distance (m)	Time (s)	Distance (m)
4.0	5.6	5.0	7.0

What was the average speed of the toy car during the two trials to the nearest tenth of a m/s?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

---

39 A scientist performed four investigations using eight different liquids. In each investigation, the scientist combined two of the liquids under a fume hood and recorded observations in the table below.

Scientist's Observations
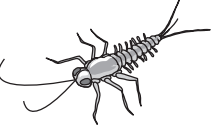
Investigation	Observations After Two Liquids Are Combined
1	The temperature of the combined liquids increased, and a solid substance formed.
2	The temperature of the combined liquids decreased, and bubbles formed.
3	One liquid settled to the bottom of the beaker, and the other liquid rose to the top.
4	The combined liquids turned from clear to a bright purple.

In which investigation is it least likely that the liquids reacted chemically?

A 1

B 2

C 3

D 4

40 The types of small organisms that live on the bottom of streams can be good indicators of water pollution. The table below groups some organisms by their tolerance of pollution.

Stream Organisms

Organisms	Tolerance of Water Pollution
Riffle beetles, Stone flies, Mayflies	Cannot tolerate pollution
Dragonflies, Sow bugs, Crayfish, Midges, Pouch snails, Aquatic worms	Can tolerate pollution

A certain stream that was historically clear and clean has become increasingly polluted with fertilizer waste over the years. Which of these describes a likely result of this pollution?

F Mayflies that were previously abundant are no longer present in the stream.

G Stone flies and midges thrive and compete for the same food source.

H Large numbers of crayfish have suddenly died.

J Riffle beetles have become more abundant in the stream.

41 The diagram below shows a sled moving along a smooth, frictionless track.
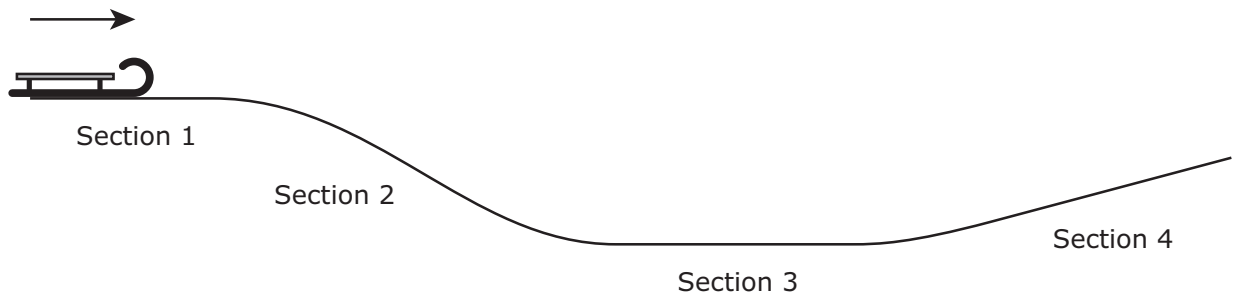
In which sections of the track will the sled experience an unbalanced force?

A Sections 1 and 3

B Sections 2 and 3

C Sections 2 and 4

D Sections 3 and 4

Page 35

42 Four students are asked to describe a nebula and a star. Their responses are shown in the table below.

Student Responses

Student	Description of a Nebula	Description of a Star
1	A collection of hot gases that sometimes produces light from nuclear reactions	A sphere of dust and gases that contains many elements and produces light from fusion and fission reactions
2	A collection of hot gases that results from stars that have exploded	A collection of gases from several nebulae hot enough to cause a nuclear reaction
3	A collection of dust and gases that forms stars or results from dying stars	A sphere of matter with a density and a temperature great enough to cause a nuclear reaction at its center
4	A collection of dust and gases that is found near stars	A collection of hot gases that forms a sphere but produces no light

Which student described these two celestial bodies correctly?

F Student 1

G Student 2

H Student 3

J Student 4

43 The masses of four vehicles and the net forces acting on them as they enter a highway are recorded in the table below.

Vehicles Entering a Highway

Vehicle	Mass (kg)	Force (N)
Sedan	1500	4500
Coupe	1200	4500
SUV	1800	4500
Truck	2000	4500

Which vehicle has the greatest acceleration as it enters the highway?

A Sedan

B Coupe

C SUV

D Truck

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44 Serotonin is a chemical substance that acts as a neurotransmitter. It helps relay messages in the human brain. The formula for one molecule of serotonin is shown below.

$$C_{10}H_{12}N_2O$$
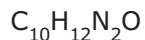
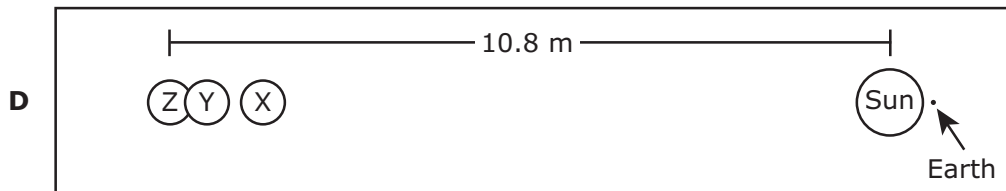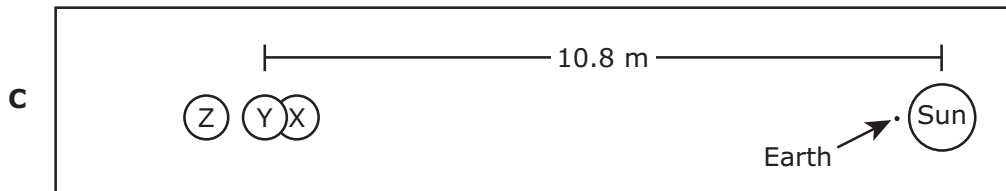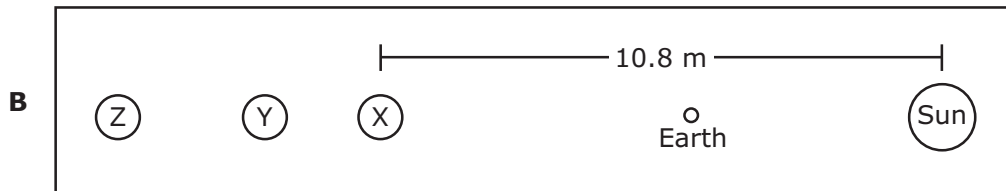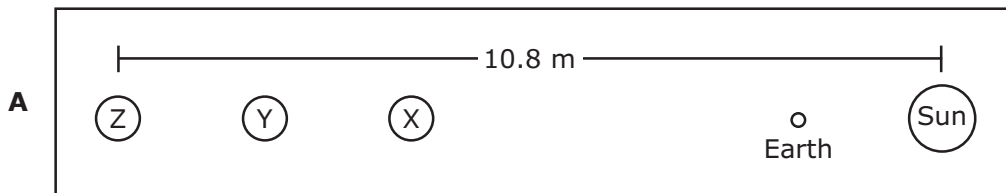How many atoms in all are in a molecule of serotonin?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

45 The table below shows the distances of three stars from the sun. Students were asked to make a model of the three stars and to include the sun and Earth in the model. They chose to use a scale of 1 meter : 1 light-year.
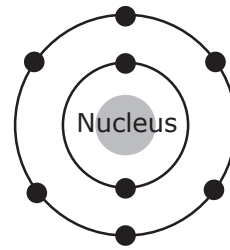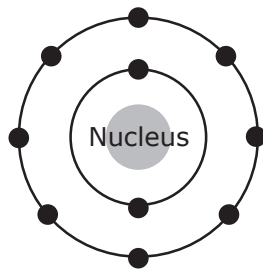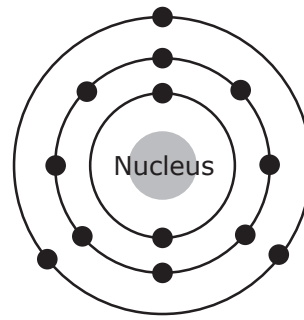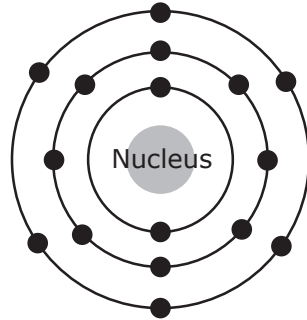
Star Data

Star	Distance from Sun (light-years)
X	9.4
Y	10.4
Z	10.8

Which model best represents the data?

A
├─────── 10.8 m ───────┤
(Z)   (Y)   (X)   ○ Earth   (Sun)

B
        ├─────── 10.8 m ───────┤
(Z)   (Y)   (X)   ○ Earth   (Sun)

C
      ├─────── 10.8 m ───────┤
      (Z)(Y)(X)   •(Sun)
                                    Earth↗

D
    ├─────── 10.8 m ───────┤
    (Z)(Y)(X)   (Sun)•
   ↖ Earth

46 A student is studying the ways different elements are similar to one another. Diagrams of atoms from four different elements are shown below.

Atom 1

Atom 2

Atom 3

Atom 4

Which two atoms are of elements in the same group in the periodic table?

F Atom 1 and Atom 2

G Atom 1 and Atom 4

H Atom 2 and Atom 3

J Atom 3 and Atom 4

47 The African savanna is a grassland scattered with shrubs and small trees. Some of the organisms that live in the savanna are shown below.
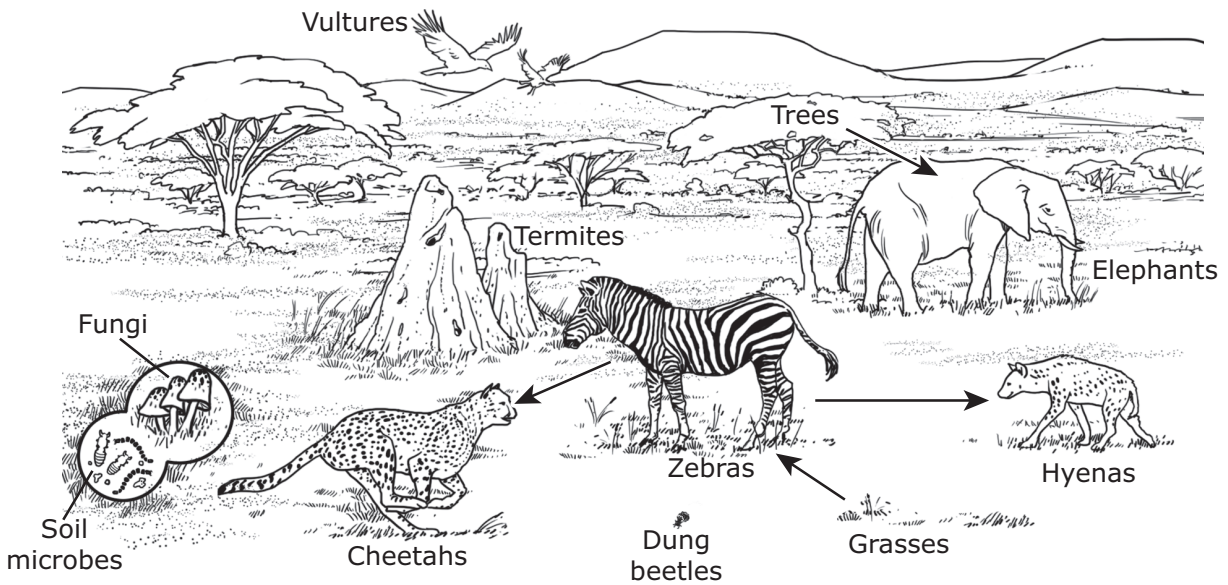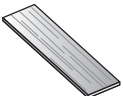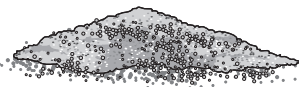

Which two types of organisms have a producer-consumer relationship in this African savanna?

A Zebras and hyenas

B Hyenas and cheetahs

C Trees and elephants

D Fungi and dung beetles

48 Some students conducted a laboratory investigation to learn more about the physical properties of different elements. They observed four samples and recorded their observations in the table below.

Properties of Four Elements

Sample	Appearance	Physical Properties
1		• Dull • Yellow • Powdery solid • Smells like eggs • Broken by hammer
2		• Silvery-gray • Solid • Shaped into a bar • Dented by hammer
3		• Reddish-brown • Shiny solid • Shaped into a wire • Can be stretched • Dented by hammer
4		• Silvery-gray • Solid • Small round pellets • Flattened by hammer

Based on these observations, which sample is most likely a nonmetal?

F Sample 1

G Sample 2

H Sample 3

J Sample 4

49 Four students volunteered to help a librarian move containers of library materials. The graph shows the amount of force used to lift the containers. The numbers in the bars show the mass of each container. The results for each student helper are shown in the table.

Data for Helpers
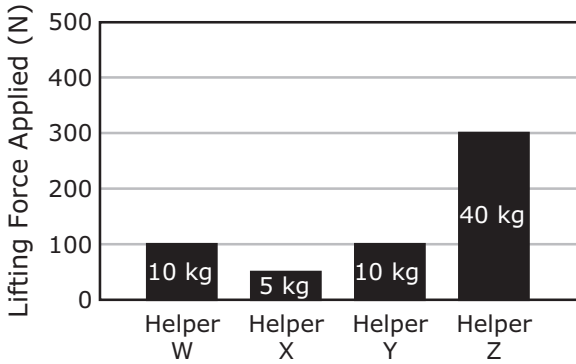
Helper	Result of Lifting Force
W	The container was raised 1 m to a shelf.
X	The container was raised 2.5 m to the top of a cabinet.
Y	The container was raised 0.5 m to a tabletop.
Z	The container was too heavy to lift even after four tries.

Based on this information, which student helper did not do any work on a container?

A Helper W

B Helper X

C Helper Y

D Helper Z

50 The hydra is a very small, simple animal that lives in water. Hydras reproduce asexually by budding, a process in which a bud breaks off an adult hydra and floats away.

© Clouds Hill Imaging Ltd./CORBIS

Which of the following best describes a hydra bud?

F A hydra bud contains genetic material from its two parents.

G A hydra bud is genetically identical to the parent hydra.

H A hydra bud has different mutations than the parent hydra.

J A hydra bud has half as much genetic material as the parent hydra.

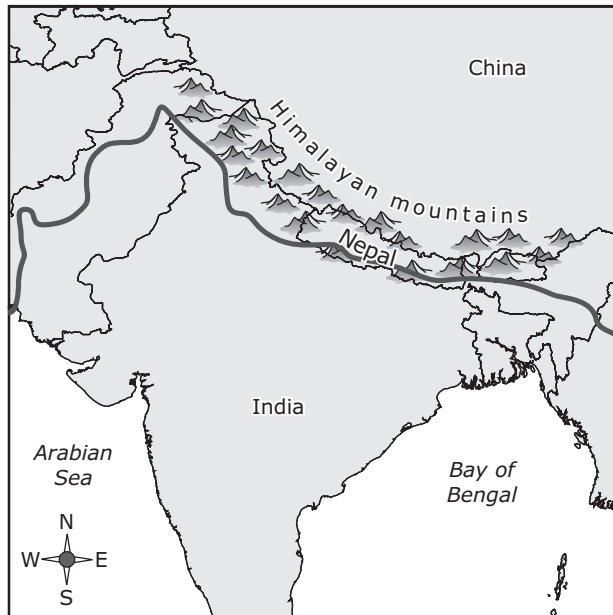**51** The table below lists three characteristics of an atom of an element.

Characteristics of an Element

Number of Protons	Number of Neutrons	Number of Valence Electrons
37	48	1

An atom of which element is described by the data in the table?

A Radon (Rn)

B Cadmium (Cd)

C Rubidium (Rb)

D Astatine (At)

52 The Himalayan mountains are shown on the map below.

Four students were asked to identify the geologic process that caused this mountain range to form. Their responses are shown below.

Student Responses

Student	Response
1	Two continental plates converging
2	An earthquake in a subduction zone
3	A tectonic plate moving over a hot spot
4	Movement at a transform fault boundary

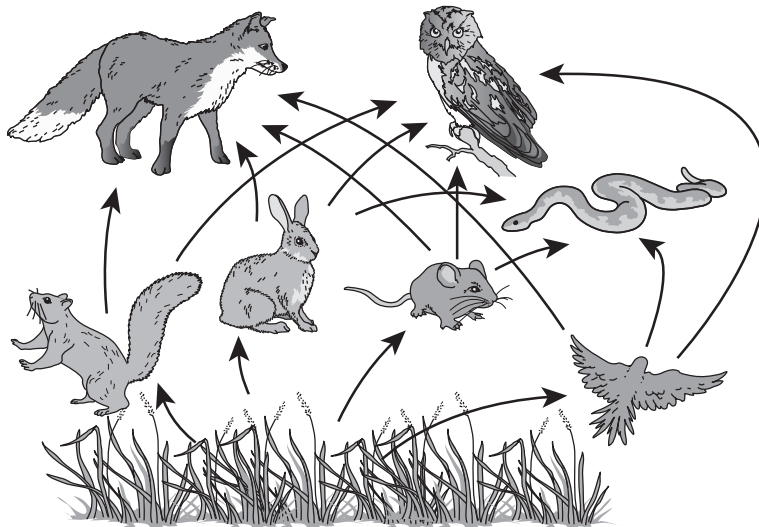Which student correctly identified the geologic process that formed the Himalayan mountains?

F Student 1

G Student 2

H Student 3

J Student 4

53 The food webs below model relationships among the organisms in two ecosystems.

Forest Food Web
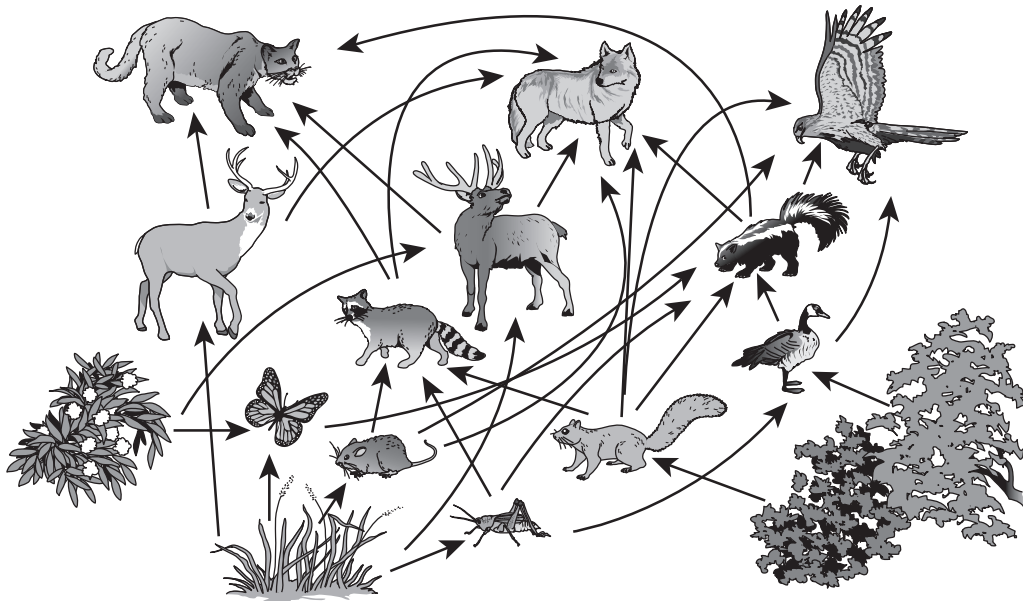
Grassland Food Web

Which ecosystem would be more likely to survive if a disease killed the grasses?

A The forest ecosystem, because most of the animals can eat other organisms

B The grassland ecosystem, because several predators compete for food

C The forest ecosystem, because it has three top predators

D The grassland ecosystem, because it has many herbivores

54 The diagram shows a homemade car being pushed with a force of 25 N.

Force = 25 N

Motion
of car
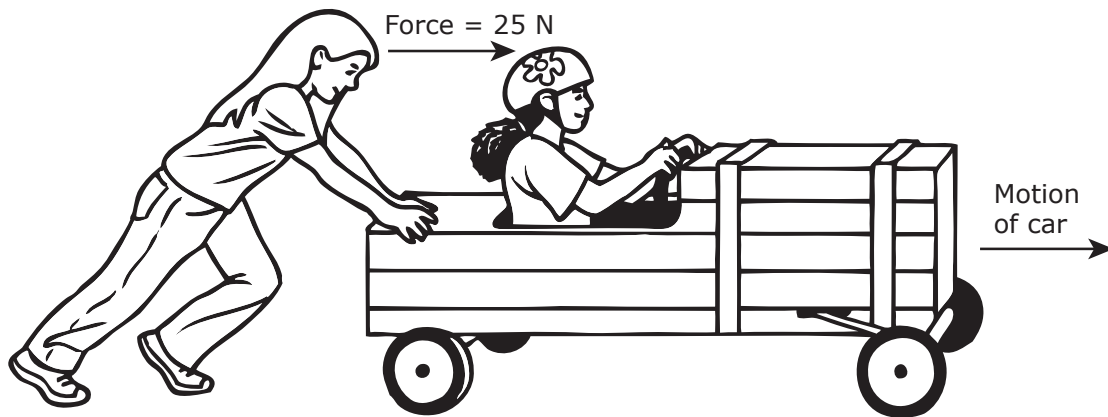
The force causes the car to move at a constant speed of 3 m/s. What will happen if the force is changed to 35 N?

F   The car will move at a constant speed of 13 m/s.

G   The speed of the car will not change.

H   The speed of the car will increase.

J   The speed of the car will decrease to 1 m/s.

BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS
ON THE ANSWER DOCUMENT.

STOP

STAAR
GRADE 8
Science
April 2014