2014 TEXAS STAAR TEST – GRADE 8 - SCIENCE

Total Possible Score: 54
Needed Correct to Pass: 30
Advanced Performance: 46

Time Limit: 4 Hours

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The number of correct answers required to "pass" this test is shown above. Because of where the "passing" score is set, it may be possible to pass the test without learning some important areas of study. Because of this, I believe that making the passing grade should not be considered "good enough." A student's goal should be to master each of the objectives covered by the test. The "Advanced Performance" score is a good goal for mastery of all the objectives.

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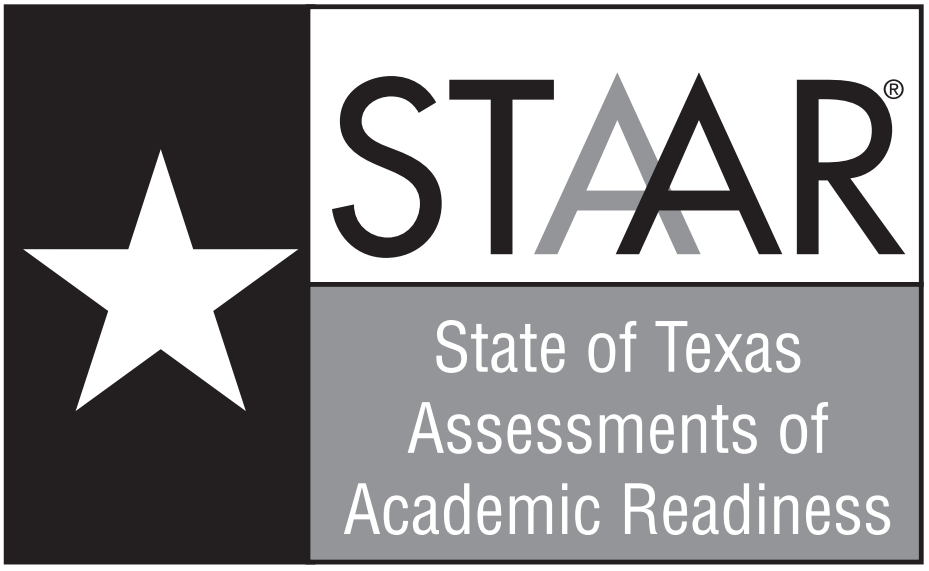

GRADE 8

Science

Administered April 2014

RELEASED

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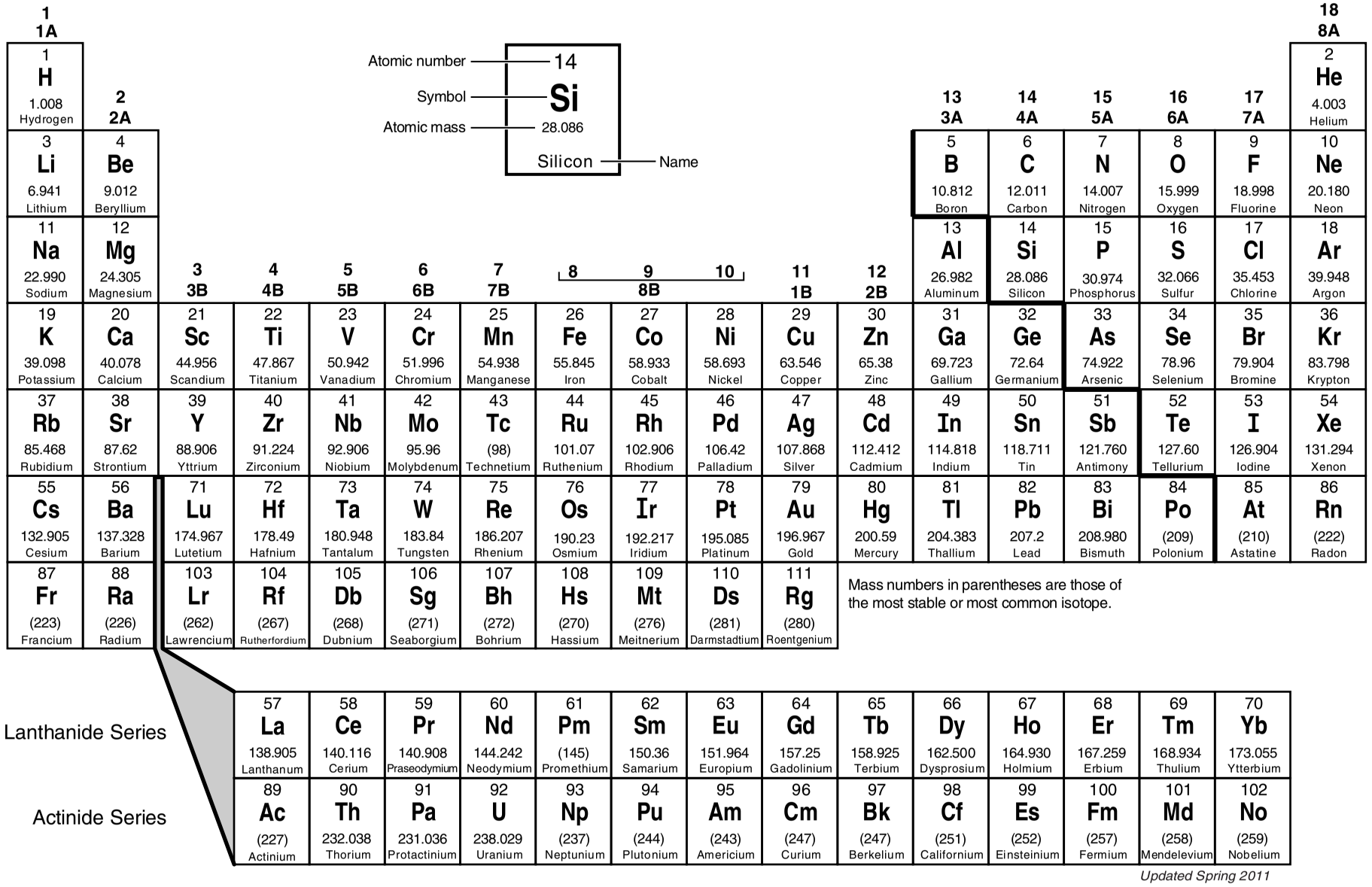
STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

FORMULAS

Density = $\frac{\text{mass}}{\text{volume}}$	$D = \frac{m}{V}$
Average speed = $\frac{\text{total distance}}{\text{total time}}$	$s = \frac{d}{t}$
Net force = (mass)(acceleration)	$F = ma$
Work = (force)(distance)	$W = Fd$

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS

PERIODIC TABLE OF THE ELEMENTS



Updated Spring 2011

SCIENCE

DIRECTIONS

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.

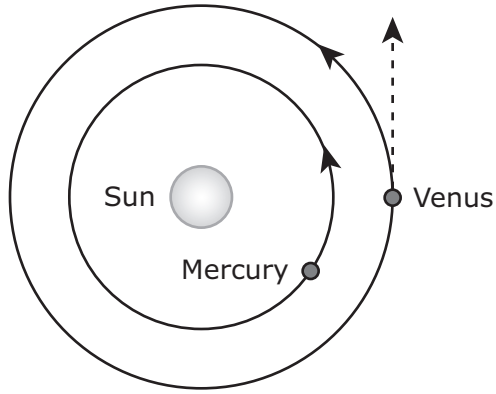
C Gravity has little effect on the speed of toy cars on different surfaces.

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

GO ON

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

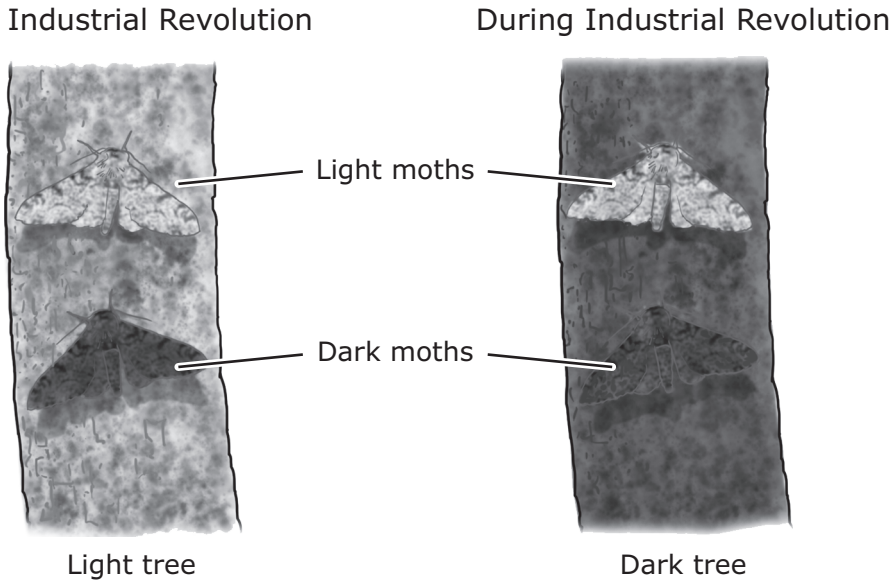
G Gravitational attraction between the sun and Venus

H Electromagnetic attraction between Mercury and Venus

J Gravitational attraction between Mercury and Venus

GO ON

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.



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.

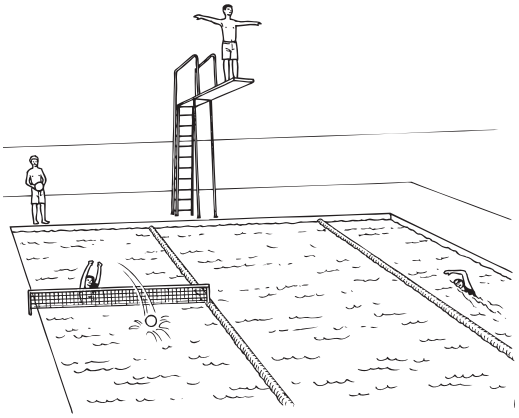
B The dark moths preyed on the light moths.

C Bird populations increased in the areas near the factories.

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

GO ON

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?

F

Student 1

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

G

Student 2

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

H

Student 3

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

J

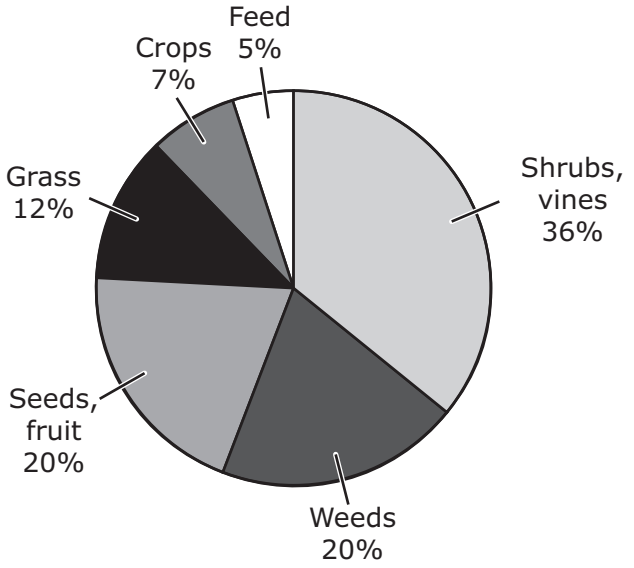
Student 4

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

GO ON

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



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

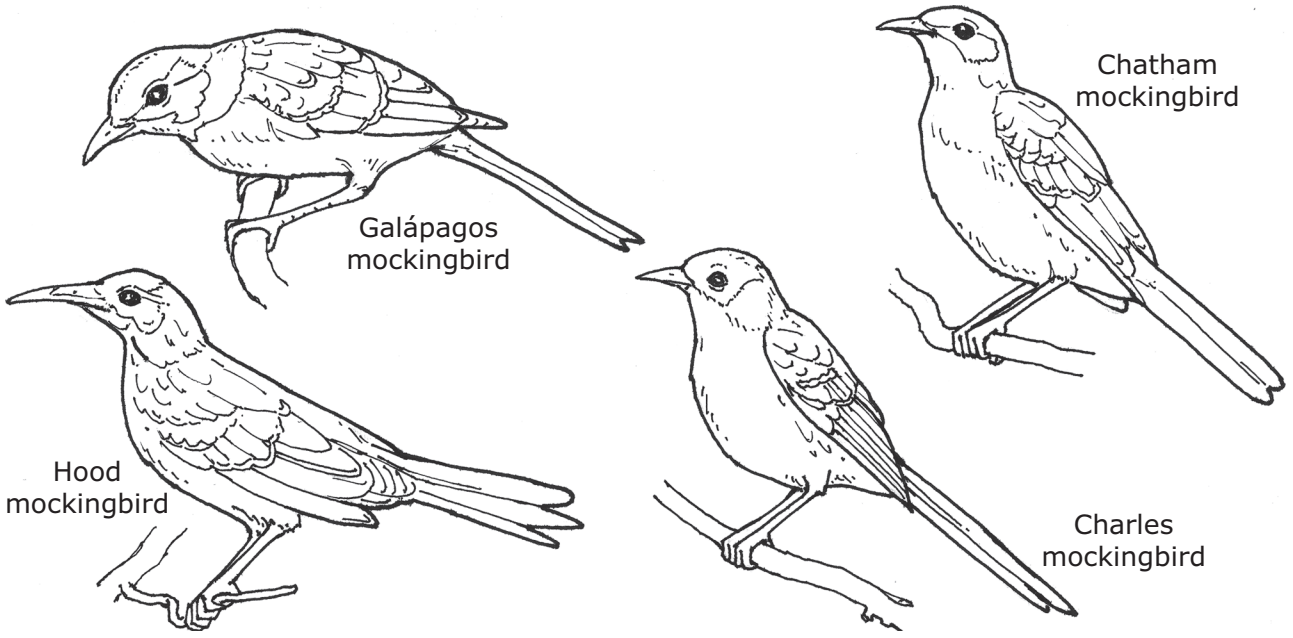
G Digestive enzymes breaking down proteins into smaller fragments

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.



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.

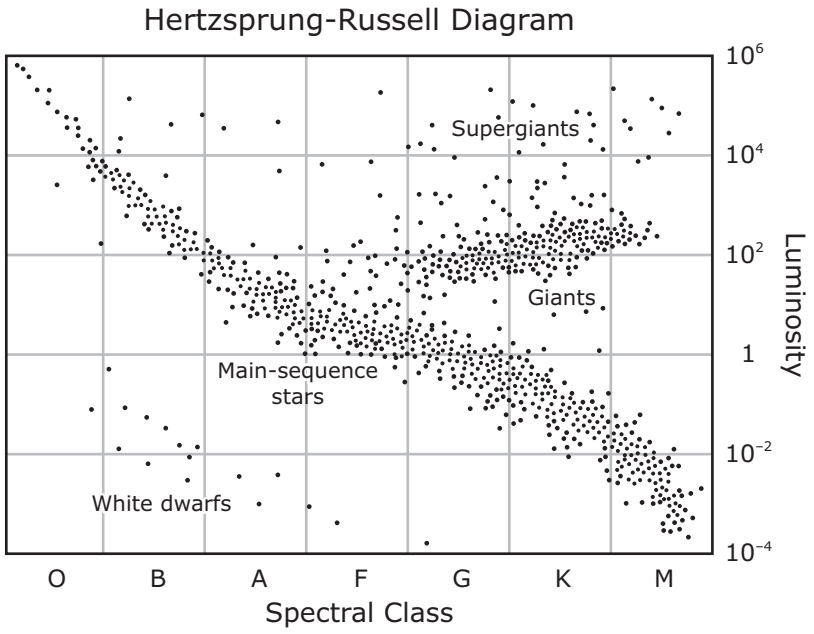
B The Hood mockingbird originated from a different type of bird than the other species.

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.

GO ON

8 A Hertzsprung-Russell diagram is shown below.



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

GO ON

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

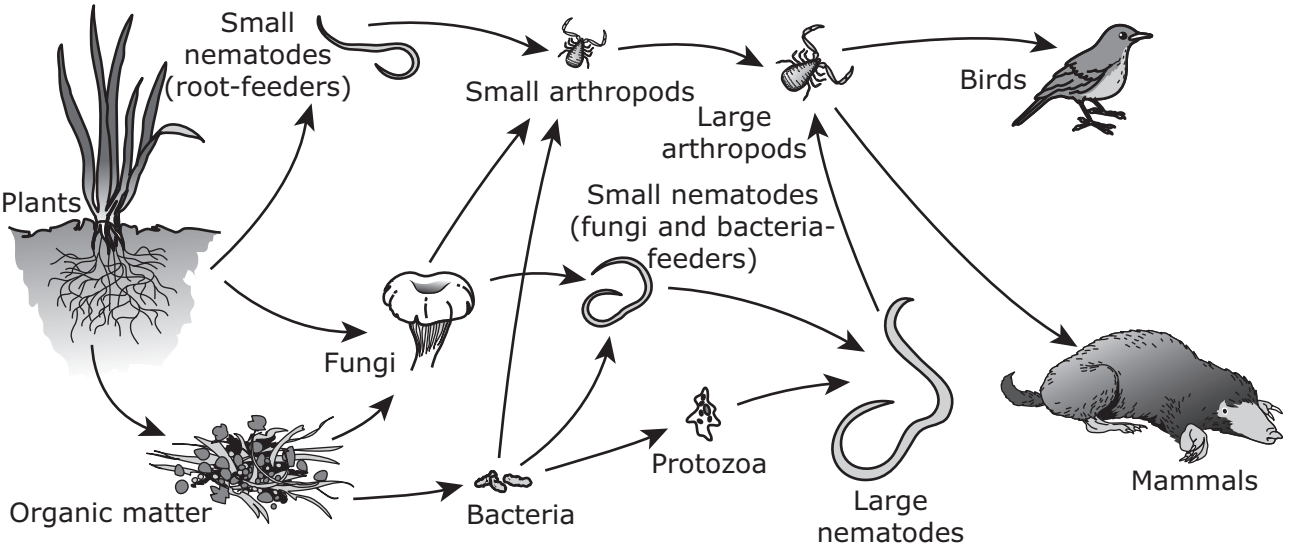
G Substance 2

H Substance 3

J Substance 4

GO ON

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.

---

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

GO ON

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.

© Stacey Lynn Payne/Shutterstock

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

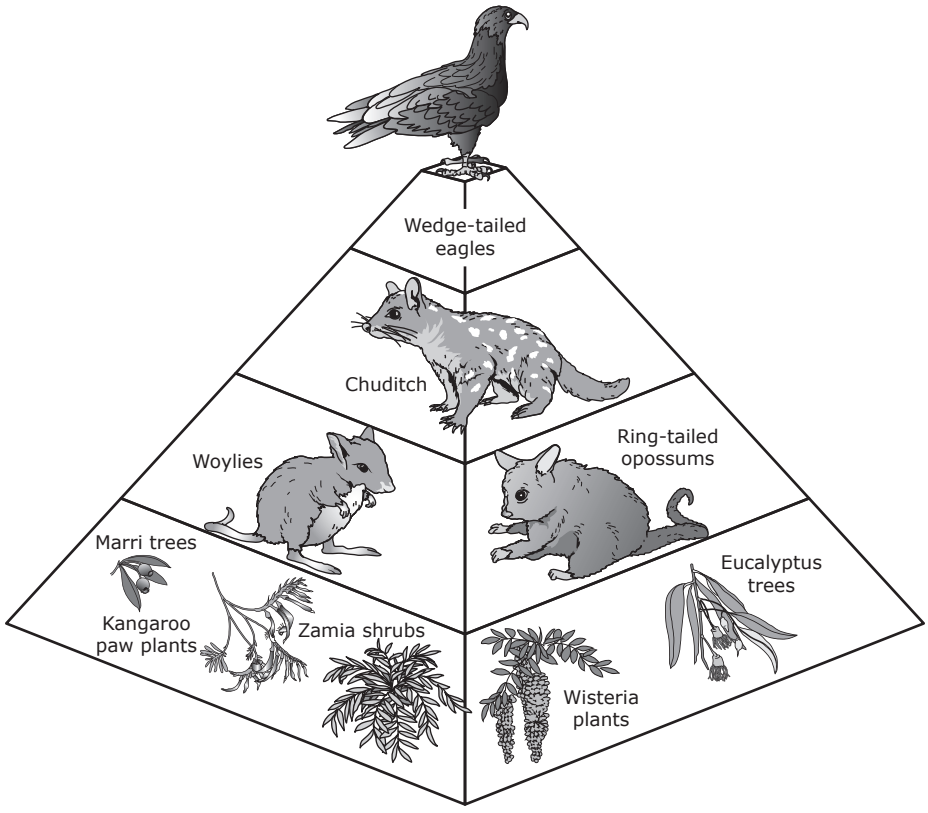
B absorb large amounts of water

C store excess gases

D filter excess salt

GO ON

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

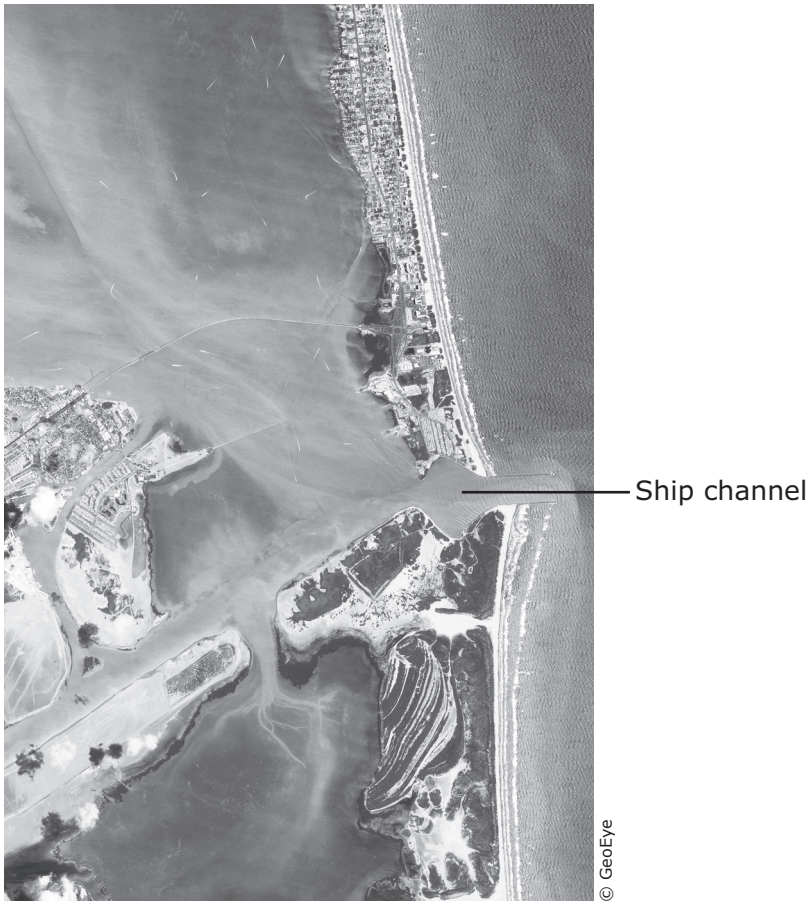
G Chuditch

H Ring-tailed opossums

J Eucalyptus trees

GO ON

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



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.

GO ON

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

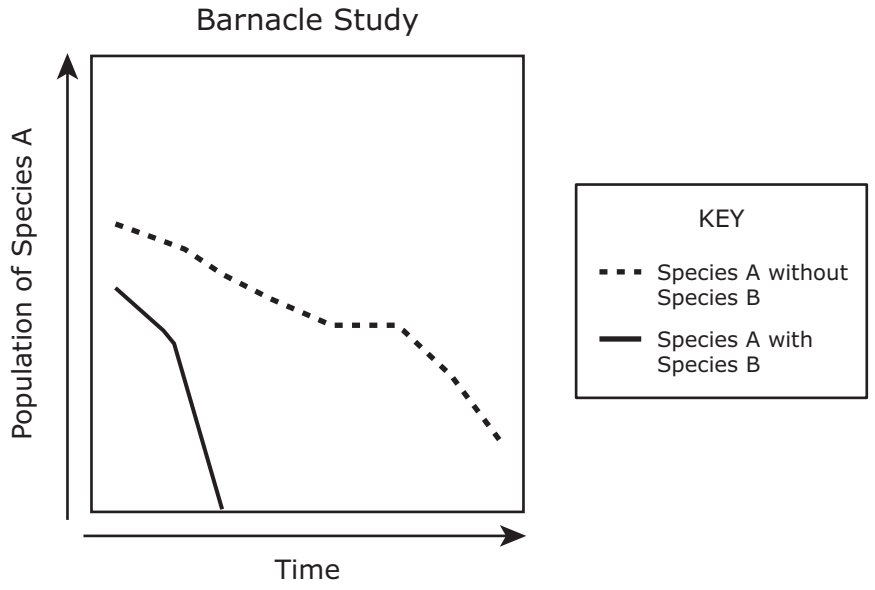
J The 2 valence electrons in each atom of calcium

---

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.



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.

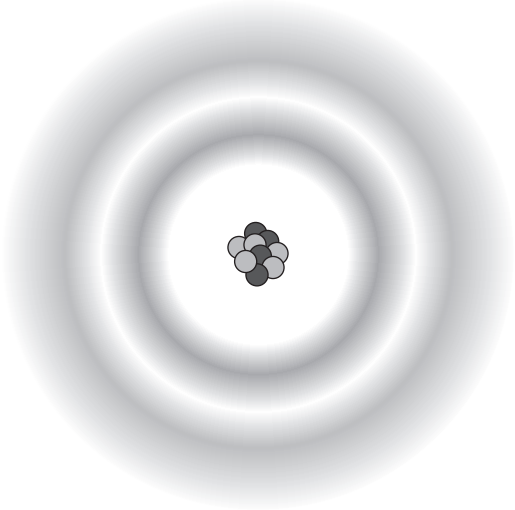
G Barnacles grow larger when they are isolated from other species.

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

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

GO ON

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

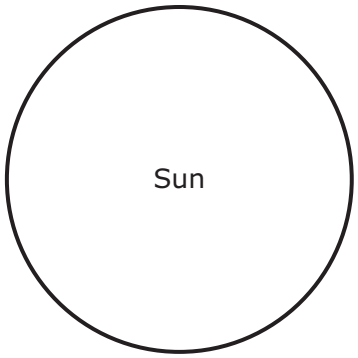
B Negatively charged particles only

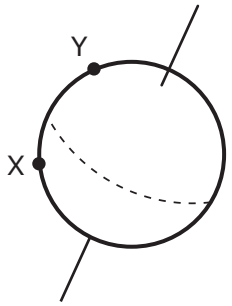
C Neutral particles and positively charged particles

D Positively charged particles only

GO ON

20 A student draws the model shown below.





Earth

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

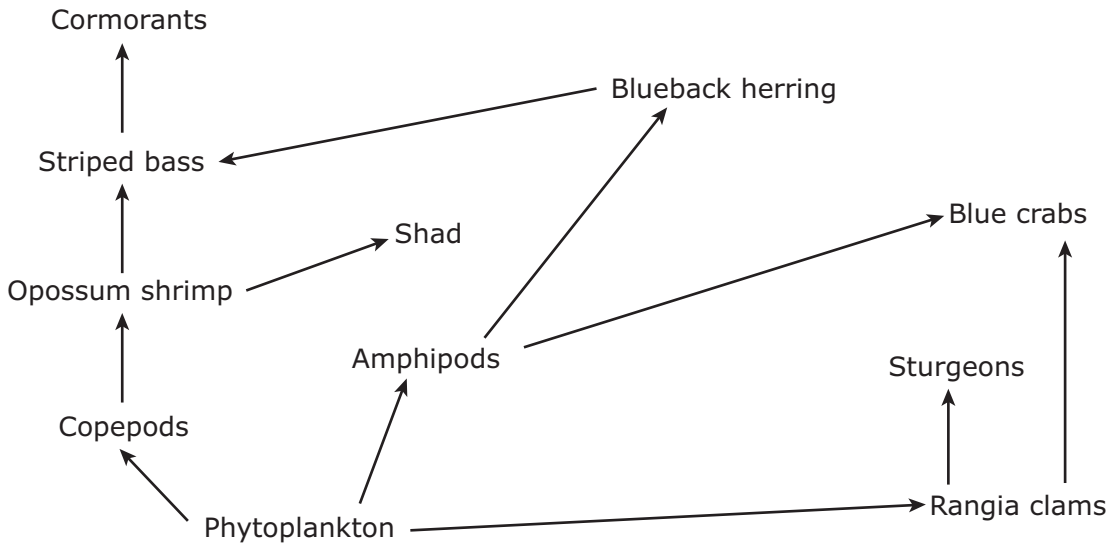
B Ammonium sulfide, $(NH_4)_2S$

C Silane, SiH_4

D Sodium chloride, NaCl

GO ON

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



F Shad and sturgeons

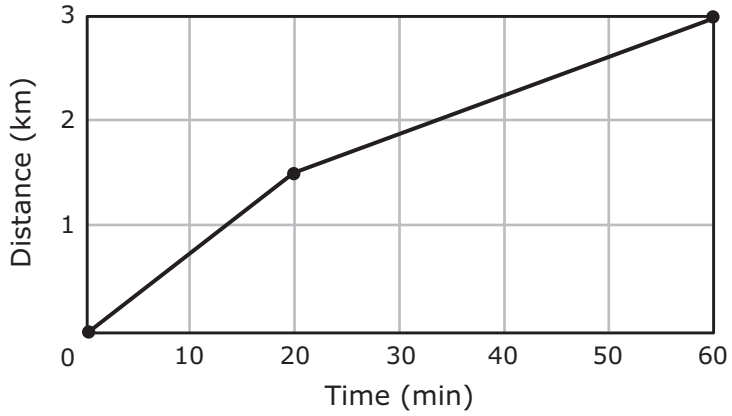
G Sturgeons and blue crabs

H Blue crabs and rangia clams

J Copepods and amphipods

GO ON

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

$$CaCO_3 \xrightarrow{heat} CaO + CO_2$$

In the chemical reaction shown above, the products are best classified as —

A two elements

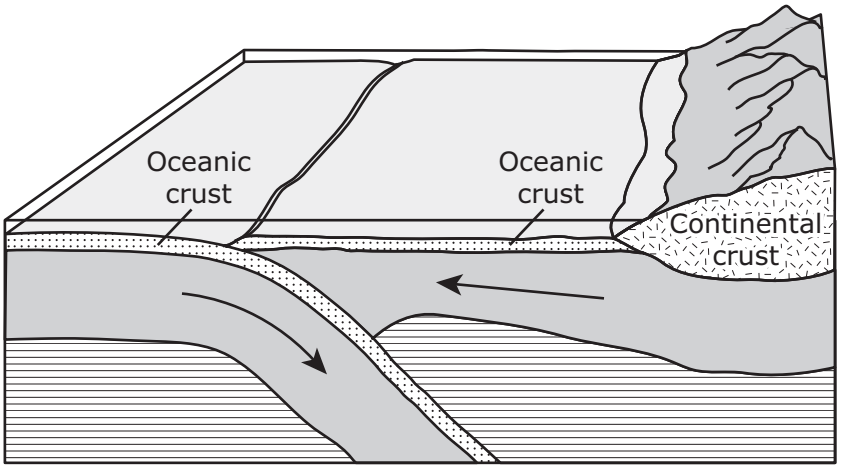
B one element and one compound

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

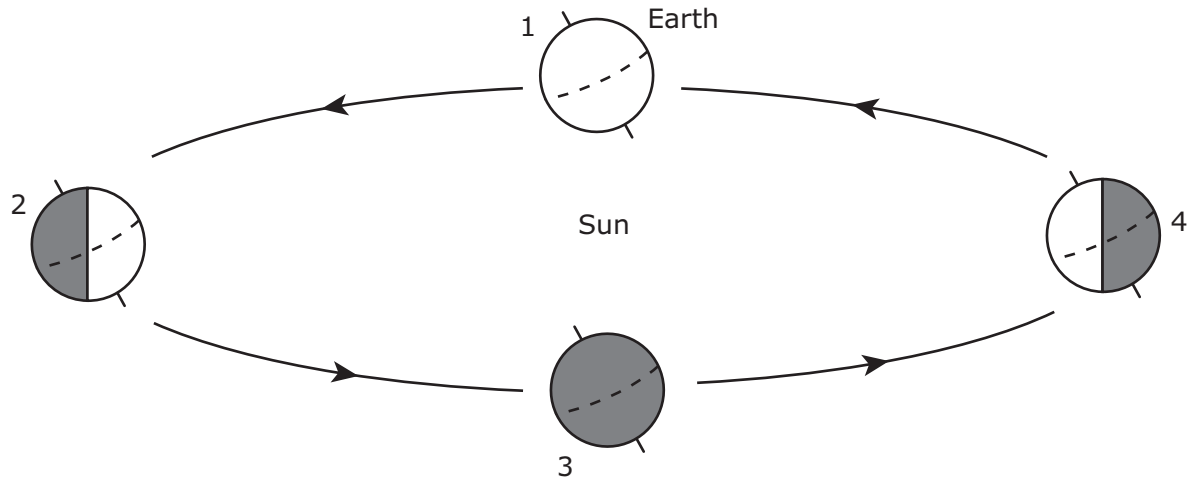
B 0.125 m/s^2

C 5 m/s^2

D 5.025 m/s^2

GO ON

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

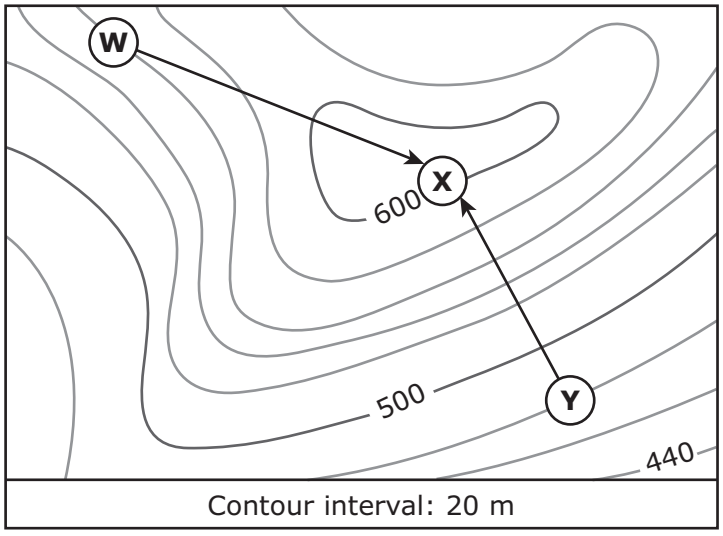
B Respiratory

C Digestive

D Circulatory

GO ON

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.



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

GO ON

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

GO ON

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.

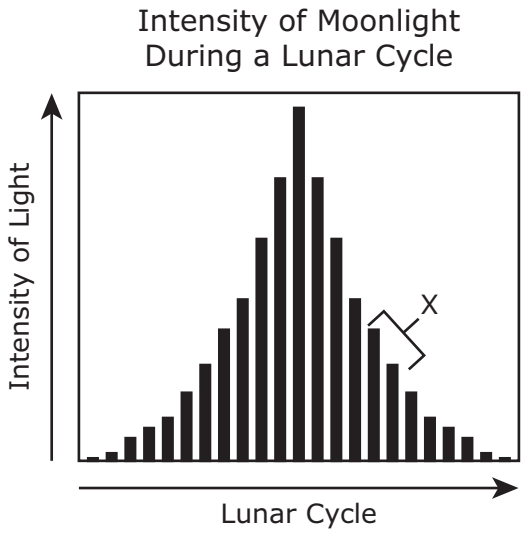
G Velocity has a direction associated with it, while speed has no specific direction.

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.

GO ON

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.



Which moon phase most likely occurs at the time in the cycle represented by an X on the graph?

A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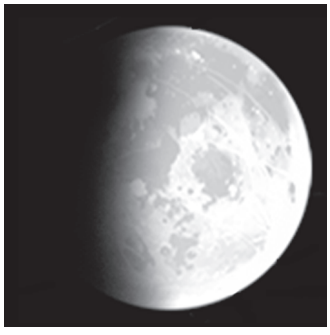
CORBIS

B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CORBIS

C


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CORBIS

D


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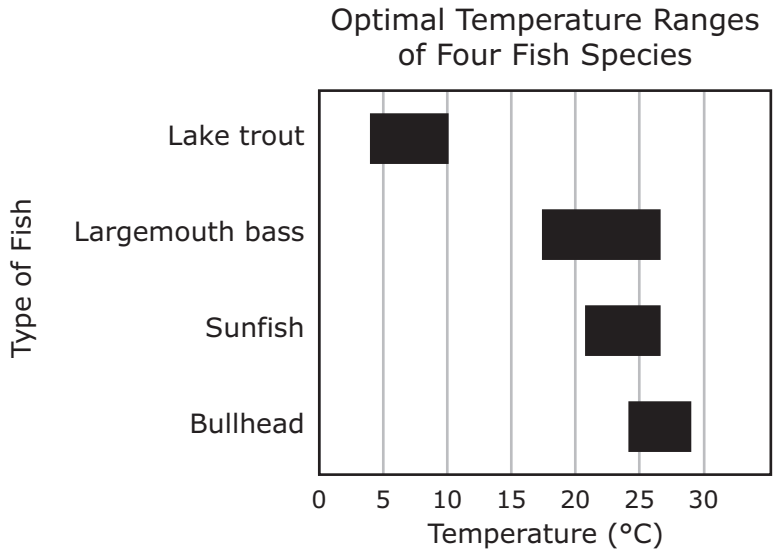
CORBIS

GO ON

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.



At which temperature range will there be the most competition for space among these fish species?

F 5°C to 10°C

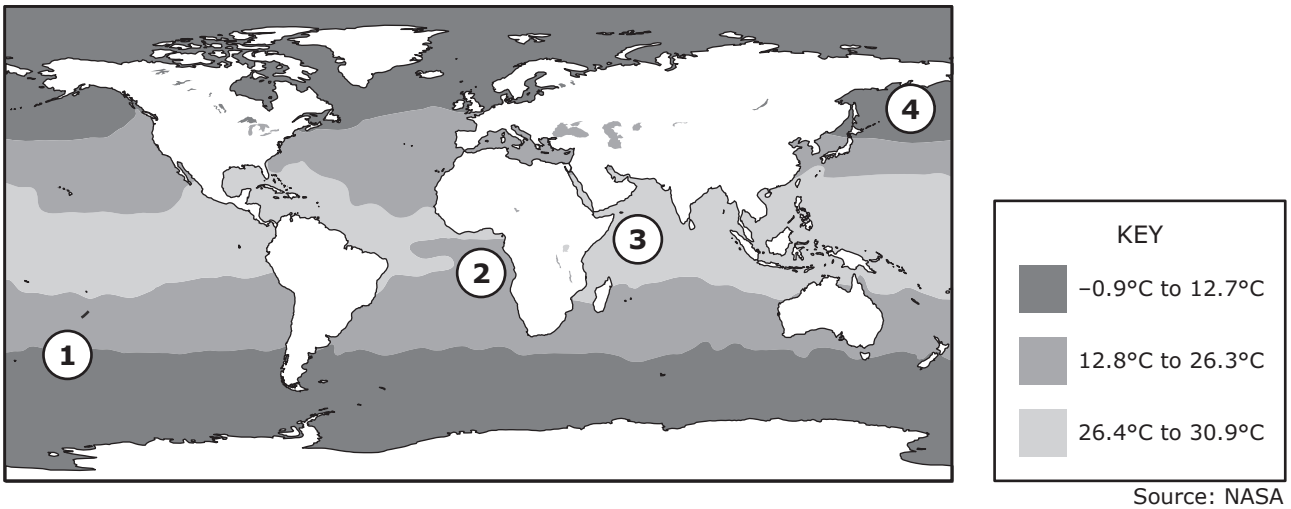
G 10°C to 15°C

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



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

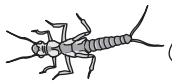
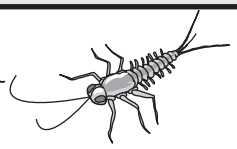
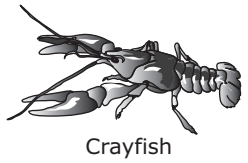
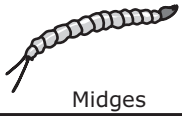
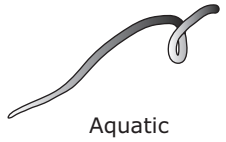
C 3

D 4

GO ON

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.

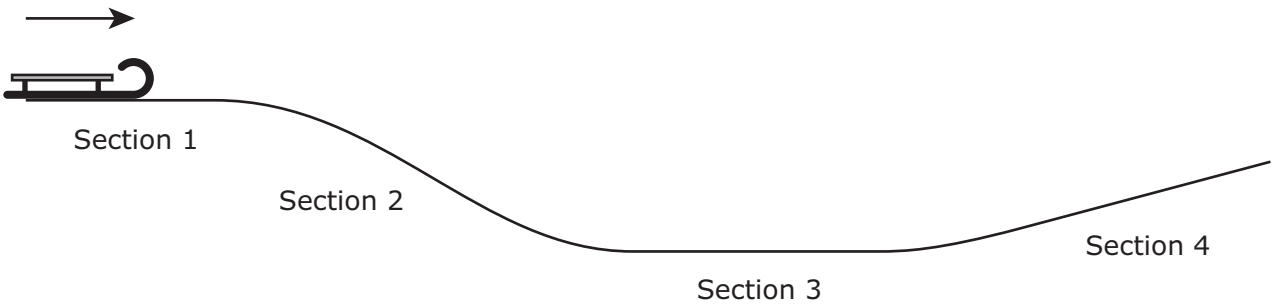
G Stone flies and midges thrive and compete for the same food source.

H Large numbers of crayfish have suddenly died.

J Riffle beetles have become more abundant in the stream.

GO ON

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

GO ON

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

GO ON

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

---

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.

GO ON

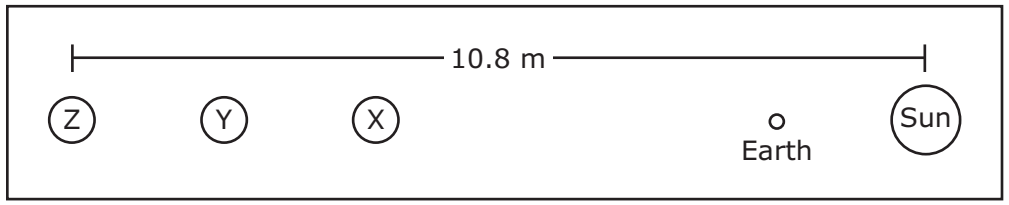
45 The table below shows the distances of three stars from the sun. Students were asked to make a model of the three stars and to include the sun and Earth in the model. They chose to use a scale of 1 meter : 1 light-year.

Star Data

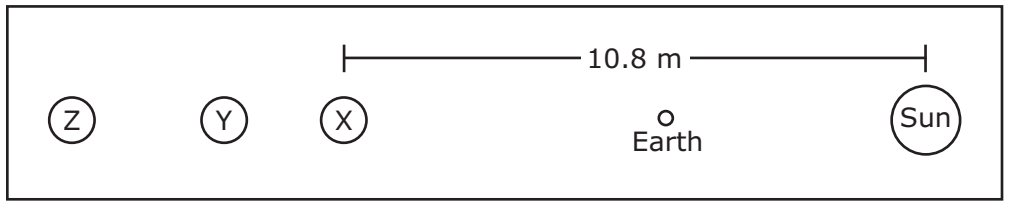
Star	Distance from Sun (light-years)
X	9.4
Y	10.4
Z	10.8

Which model best represents the data?

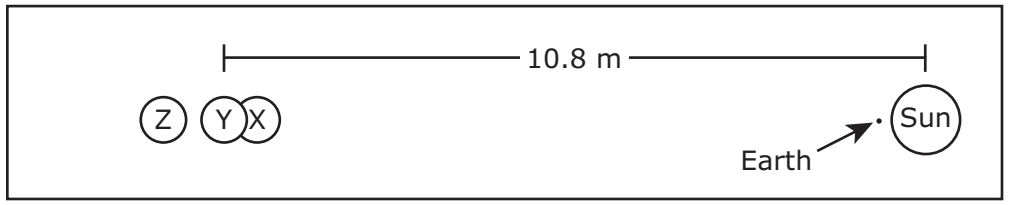
A



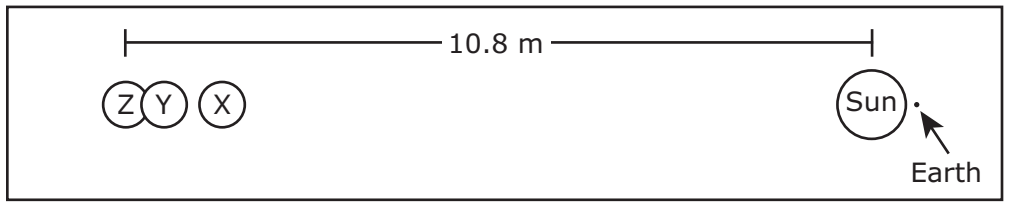
B



C

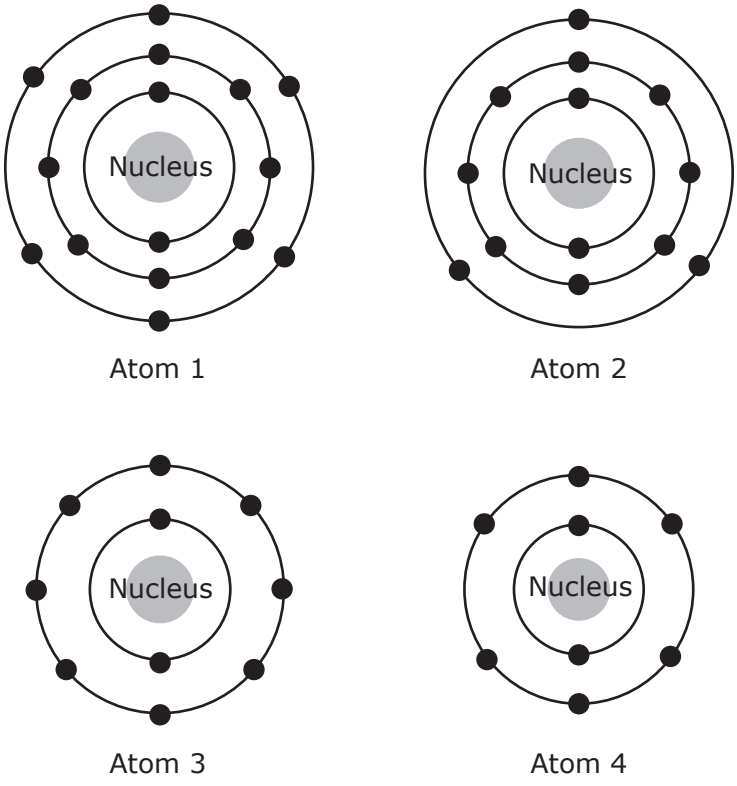


D



GO ON

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



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

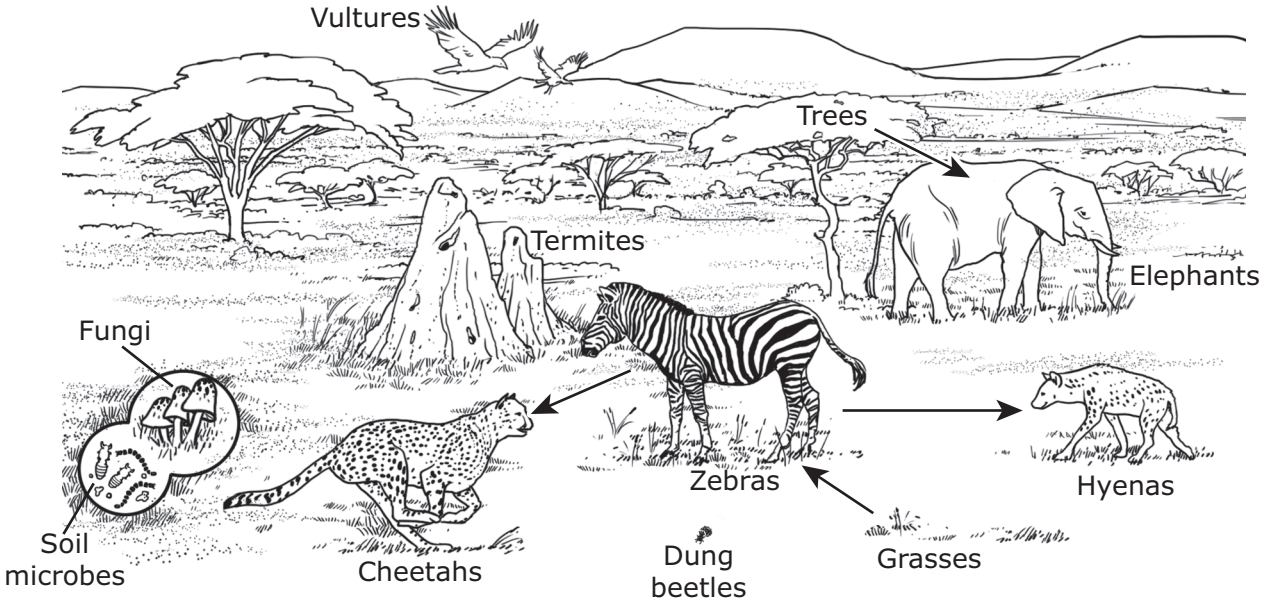
F Atom 1 and Atom 2

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

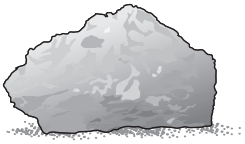
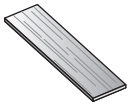
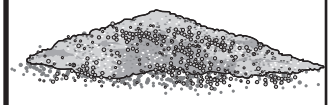
C Trees and elephants

D Fungi and dung beetles

GO ON

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

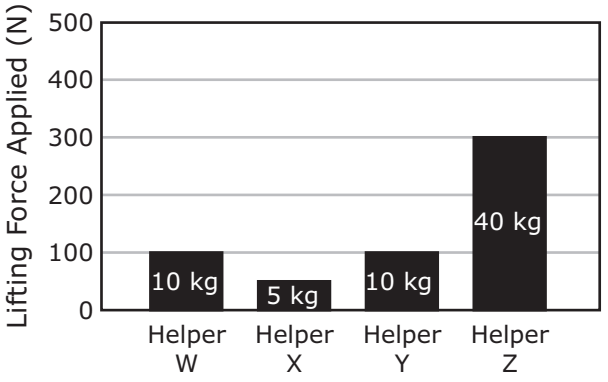
H Sample 3

J Sample 4

GO ON

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

GO ON

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)

GO ON

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

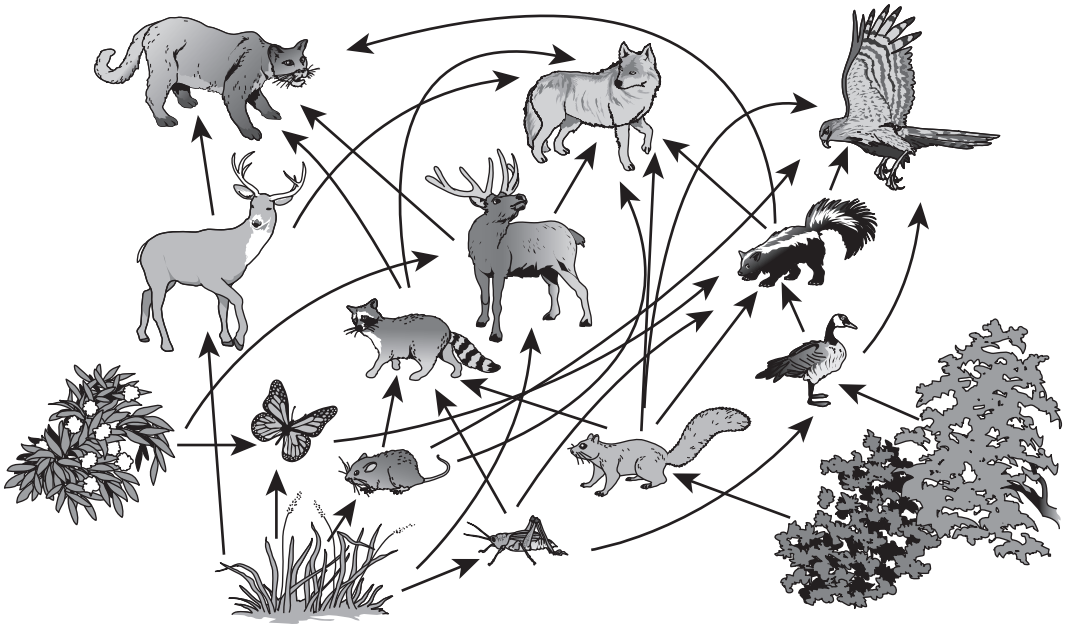
H Student 3

J Student 4

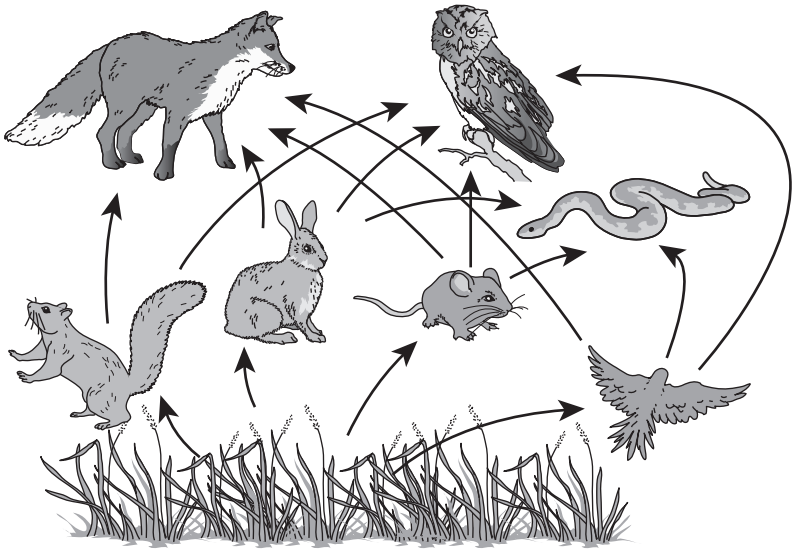
GO ON

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

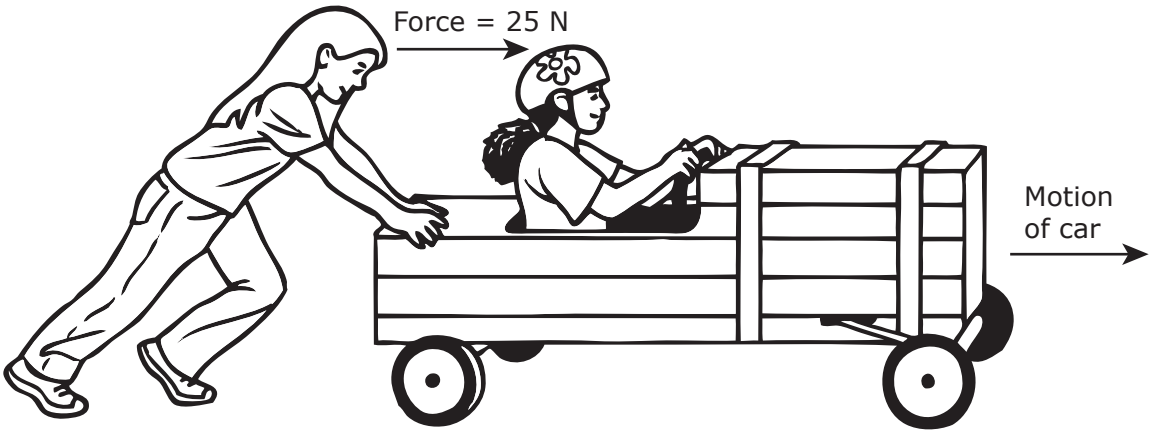
B The grassland ecosystem, because several predators compete for food

C The forest ecosystem, because it has three top predators

D The grassland ecosystem, because it has many herbivores

GO ON

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



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.

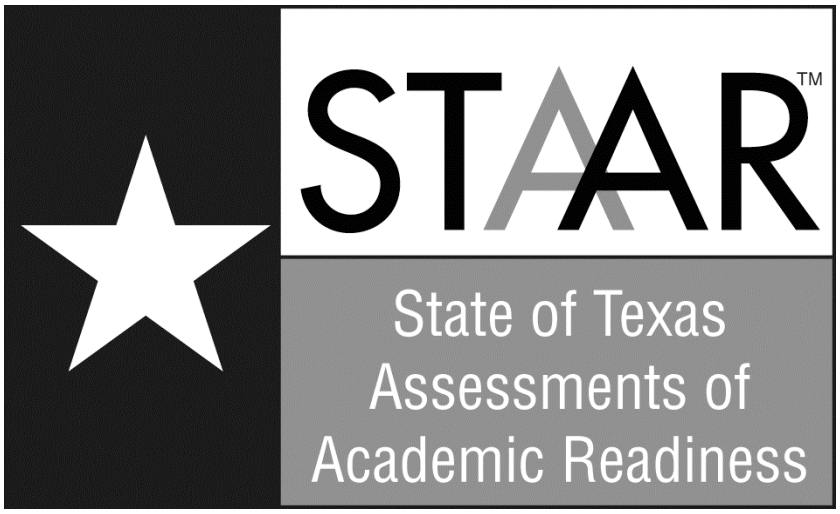
BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS ON THE ANSWER DOCUMENT.

STOP

STAAR
GRADE 8
Science
April 2014

866201 1 2 3 4 5 A B C D E Printed in the USA ISD7195

Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Process Student Expectation	Correct Answer
1	2	Readiness	8.6(C)	8.2(E)	A
2	3	Supporting	6.11(B)	8.3(B)	G
3	4	Readiness	8.11(C)	8.3(D)	A
4	2	Supporting	6.8(A)	8.2(E)	J
5	4	Readiness	8.11(B)	8.2(D)	B
6	1	Supporting	7.6(B)		J
7	4	Supporting	7.11(C)	8.3(D)	C
8	3	Readiness	8.8(A)	8.2(E)	J
9	2	Supporting	6.9(C)		A
10	1	Readiness	8.5(E)	8.2(E)	G
11	4	Readiness	8.11(A)	8.3(B)	D
12	3	Supporting	8.9(A)		G
13	4	Readiness	8.11(C)		D
14	1	Supporting	7.5(C)	8.3(B)	H
15	3	Readiness	8.9(C)	8.2(E)	B
16	1	Readiness	8.5(B)		J
17	2	Readiness	8.6(A)		1740
18	4	Readiness	8.11(B)	8.2(B)	H
19	1	Readiness	8.5(A)	8.3(B)	B
20	3	Readiness	8.7(A)	8.3(B)	H
21	1	Supporting	7.6(A)		A
22	4	Readiness	8.11(A)	8.3(B)	H
23	2	Supporting	6.8(D)	8.2(E)	B
24	3	Readiness	8.7(B)	8.2(E)	F
25	1	Supporting	6.5(C)	8.3(B)	C
26	3	Readiness	8.9(B)	8.3(B)	G
27	2	Readiness	8.6(A)		A
28	3	Readiness	8.7(A)	8.3(B)	H
29	4	Supporting	7.12(B)		D
30	3	Readiness	8.9(C)	8.3(B)	120
31	1	Readiness	8.5(D)		A
32	4	Supporting	7.12(F)	8.3(D)	G
33	1	Readiness	8.5(A)		D
34	2	Supporting	8.6(B)		G
35	3	Readiness	8.7(B)	8.2(E)	C
36	4	Readiness	8.11(B)	8.2(E)	J
37	3	Supporting	8.10(C)	8.3(B)	C
38	2	Supporting	6.8(C)	8.2(D)	1.4
39	1	Readiness	8.5(E)	8.2(E)	C
40	4	Readiness	8.11(C)	8.2(E)	F
41	2	Readiness	8.6(A)		C
42	3	Readiness	8.8(A)	8.2(E)	H
43	2	Readiness	8.6(C)	8.2(E)	B
44	1	Readiness	8.5(D)		25
45	3	Supporting	8.8(D)	8.3(B)	D
46	1	Readiness	8.5(C)	8.3(B)	G
47	4	Readiness	8.11(A)	8.3(B)	C
48	1	Supporting	6.6(A)	8.2(E)	F
49	2	Supporting	7.7(A)	8.2(E)	D
50	4	Supporting	7.14(B)		G
51	1	Readiness	8.5(B)		C
52	3	Readiness	8.9(B)		F
53	4	Supporting	7.10(B)	8.3(B)	A
54	2	Readiness	8.6(A)		H



Grade 8 Science Assessment

Eligible Texas Essential Knowledge and Skills

Texas Education Agency
Student Assessment Division
Fall 2010

STAAR Grade 8 Science Assessment

Reporting Category 1: Matter and Energy

The student will demonstrate an understanding of the properties of matter and energy and their interactions.

Grade 8

(8.5) **Matter and energy.** The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to

(A) describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud; ***Readiness Standard***

(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity; ***Readiness Standard***

(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements; ***Readiness Standard***

(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts; ***Readiness Standard***

(E) investigate how evidence of chemical reactions indicate that new substances with different properties are formed; and ***Readiness Standard***

(F) recognize whether a chemical equation containing coefficients is balanced or not and how that relates to the law of conservation of mass. ***Supporting Standard***

Texas Education Agency
Student Assessment Division
Fall 2010

Grade 7

(7.5) **Matter and energy.** The student knows that interactions occur between matter and energy. The student is expected to

(C) diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids. ***Supporting Standard***

(7.6) **Matter and energy.** The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. The student is expected to

(A) identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur; and ***Supporting Standard***

(B) distinguish between physical and chemical changes in matter in the digestive system. ***Supporting Standard***

Grade 6

(6.5) **Matter and energy.** The student knows the differences between elements and compounds. The student is expected to

(C) differentiate between elements and compounds on the most basic level. ***Supporting Standard***

(6.6) **Matter and energy.** The student knows matter has physical properties that can be used for classification. The student is expected to

(A) compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability; and ***Supporting Standard***

(B) calculate density to identify an unknown substance. ***Supporting Standard***

Reporting Category 2:
Force, Motion, and Energy

The student will demonstrate an understanding of force, motion, and energy and their relationships.

Grade 8

(8.6) **Force, motion, and energy.** The student knows that there is a relationship between force, motion, and energy. The student is expected to

(A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion;
Readiness Standard

(B) differentiate between speed, velocity, and acceleration; and
Supporting Standard

(C) investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches. ***Readiness Standard***

Grade 7

(7.7) **Force, motion, and energy.** The student knows that there is a relationship among force, motion, and energy. The student is expected to

(A) contrast situations where work is done with different amounts of force to situations where no work is done such as moving a box with a ramp and without a ramp, or standing still.
Supporting Standard

Grade 6

(6.8) **Force, motion, and energy.** The student knows force and motion are related to potential and kinetic energy. The student is expected to

(A) compare and contrast potential and kinetic energy;
Supporting Standard

Texas Education Agency
Student Assessment Division
Fall 2010

(C) calculate average speed using distance and time measurements; and ***Supporting Standard***

(D) measure and graph changes in motion. ***Supporting Standard***

(6.9) **Force, motion, and energy.** The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form. The student is expected to

(C) demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy. ***Supporting Standard***

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Student Assessment Division
Fall 2010

Reporting Category 3:
Earth and Space

The student will demonstrate an understanding of components, cycles, patterns, and natural events of Earth and space systems.

Grade 8

(8.7) **Earth and space.** The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to

(A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons; ***Readiness Standard***

(B) demonstrate and predict the sequence of events in the lunar cycle; and ***Readiness Standard***

(C) relate the position of the Moon and Sun to their effect on ocean tides. ***Supporting Standard***

(8.8) **Earth and space.** The student knows characteristics of the universe. The student is expected to

(A) describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification; ***Readiness Standard***

(B) recognize that the Sun is a medium-sized star near the edge of a disc-shaped galaxy of stars and that the Sun is many thousands of times closer to Earth than any other star; ***Supporting Standard***

(C) explore how different wavelengths of the electromagnetic spectrum such as light and radio waves are used to gain information about distances and properties of components in the universe; and ***Supporting Standard***

(D) model and describe how light years are used to measure distances and sizes in the universe. ***Supporting Standard***

(8.9) **Earth and space.** The student knows that natural events can impact Earth systems. The student is expected to

(A) describe the historical development of evidence that supports plate tectonic theory; ***Supporting Standard***

(B) relate plate tectonics to the formation of crustal features; and ***Readiness Standard***

(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering. ***Readiness Standard***

(8.10) **Earth and space.** The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to

(A) recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds and ocean currents; ***Supporting Standard***

(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and ***Supporting Standard***

(C) identify the role of the oceans in the formation of weather systems such as hurricanes. ***Supporting Standard***

Grade 7

(7.8) **Earth and space.** The student knows that natural events and human activity can impact Earth systems. The student is expected to

(C) model the effects of human activity on groundwater and surface water in a watershed. ***Supporting Standard***

Grade 6

(6.11) **Earth and space.** The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to

(B) understand that gravity is the force that governs the motion of our solar system. ***Supporting Standard***

Reporting Category 4:
Organisms and Environments

The student will demonstrate an understanding of the structures and functions of living organisms and their interdependence on each other and on their environment.

Grade 8

(8.11) **Organisms and environments.** The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. The student is expected to

(A) describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems; ***Readiness Standard***

(B) investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition; ***Readiness Standard***

(C) explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and ***Readiness Standard***

(D) recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems. ***Supporting Standard***

Grade 7

(7.10) **Organisms and environments**. The student knows that there is a relationship between organisms and the environment. The student is expected to

(B) describe how biodiversity contributes to the sustainability of an ecosystem; and ***Supporting Standard***

(C) observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds. ***Supporting Standard***

(7.11) **Organisms and environments.** The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. The student is expected to

(A) examine organisms or their structures such as insects or leaves and use dichotomous keys for identification; and ***Supporting Standard***

(C) identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals.
Supporting Standard

(7.12) **Organisms and environments.** The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. The student is expected to

(B) identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems; ***Supporting Standard***

(D) differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole; and
Supporting Standard

(F) recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life.
Supporting Standard

(7.14) **Organisms and environments.** The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. The student is expected to

(B) compare the results of uniform or diverse offspring from sexual reproduction or asexual reproduction; and
Supporting Standard

(C) recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus. ***Supporting Standard***

Grade 6

(6.12) **Organisms and environments.** The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to

(D) identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms. ***Supporting Standard***

Scientific Investigation and Reasoning Skills

These skills will not be listed under a separate reporting category. Instead, they will be incorporated into at least 40% of the test questions in reporting categories 1–4 and will be identified along with content standards.

Grade 8

(8.1) **Scientific investigation and reasoning.** The student, for at least 40% of instructional time, conduct laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices. The student is expected to

(A) demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards; and

(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.

(8.2) **Scientific investigation and reasoning.** The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to

(A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;

(B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;

(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;

(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and

(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.

(8.3) **Scientific investigation and reasoning.** The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and know the contributions of relevant scientists. The student is expected to

(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;

(B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;

(C) identify advantages and limitations of models such as size, scale, properties, and materials; and

(D) relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.

(8.4) **Scientific investigation and reasoning.** The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to

(A) use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectroscopes, timing devices, and other equipment as needed to teach the curriculum; and

(B) use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.