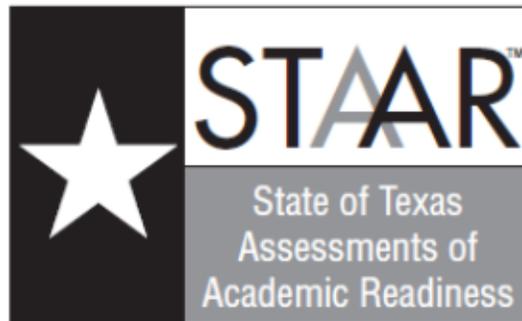


Name_____

Teacher_____ Period_____



SCIENCE
Grade 8

CMS 8th Grade Science STAAR Benchmark

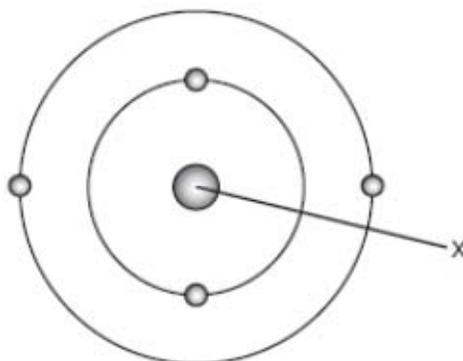
February 2012

Time Completed_____

RC 1, 8.5A (R)

1. There are three main types of subatomic particles in an atom. Which of these particles balance the charge of the atom?
- A Protons and neutrons
 - B Electrons and neutron
 - C Protons and electrons
 - D Protons, electrons, and neutrons

RC 1, 8.5A (R)



2. Which of these best describes one of the subatomic particles that could be found at location X in the model of an atom shown above?
- F It has mass but no charge.
 - G It has no mass and a positive charge.
 - H It has a large mass and a negative charge.
 - J It has no mass and an equal number of positive and negative charges.

RC 1, 8.5A (R)

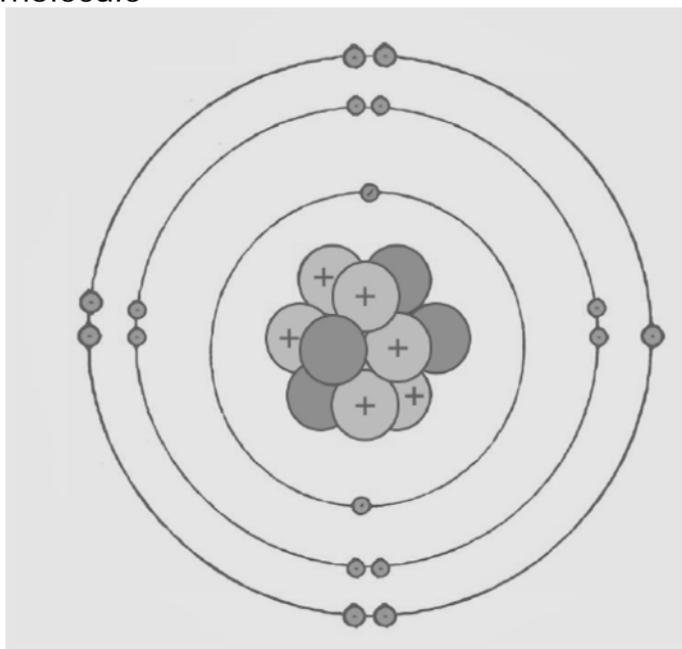
Subatomic Particle	Symbol	Mass in amu
Proton	p^+	1.00728 amu
Neutron	n^0	1.00867 amu
Electron	e^-	0.000549 amu

3. You need to find the mass of an atom. This atom contains 8 neutrons, 7 electrons, and 7 protons. What is the mass of this atom (in whole numbers)?

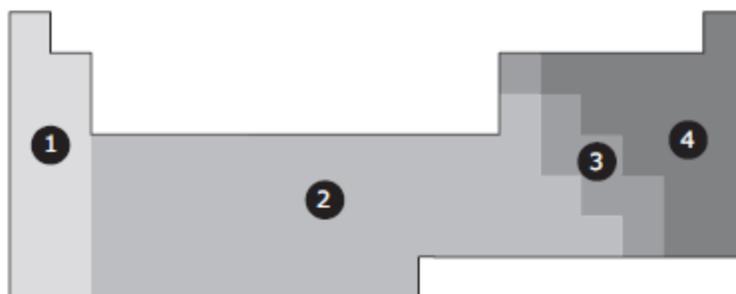
Record the answer on the space in your answer document

4. Which type of atom do the following characteristics best describe?
- Loses its electrons easily
 - Has a shiny appearance
 - Contains fewer valence electrons

- F** A metal
G A negative ion
H A non-metal
J A molecule



5. This model represents the element chlorine. How will it react if it is combined with a sodium atom with one valence electron?
- A** Sodium will steal chlorine's 7 valence electrons to satisfy the Octet Rule.
B Sodium will steal 3 valence electrons from chlorine to equalize their valence electrons.
C Chlorine will steal sodium's 1 valence electron to satisfy the Octet Rule.
D Chlorine will lose 3 valence electrons to sodium to equalize their valence electrons.



6. An element has a metallic-gray appearance. It also has the properties of both a metal and a nonmetal. In which section of the periodic table indicated above would the element most likely be found?

- F 1
- G 2
- H 3
- J 4

Periodic Table of Elements

1A		2A												3A		4A	5A	6A	7A	8A	
1 H 1.008	3 Li 6.941	4 Be 9.012											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 18.00	10 Ne 20.18			
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95				
3B		4B	5B	6B	7B	8B		1B	2B												
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.64	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80				
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.96	43 Tc 98	44 Ru 101.07	45 Rh 101.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.29				
55 Cs 132.91	56 Ba 137.33	57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm 145	62 Sm 150.36	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.05	71 Lu 174.97					
		†Actinides		89 Th 232.04	90 Pa 231.04	91 U 238.03	92 Np 237	93 Pu 239	94 Am 243	95 Cm 247	96 Bk 247	97 Cf 251	98 Es 252	99 Fm 257	100 Md 258	101 No 259	102 Lr 262				

KEY

- Non-Metals
- Metalloids
- Metals

1 ← Atomic Number
H ← Chemical Symbol
 Hydrogen ← Chemical Name
 1.008 ← Atomic Weight

→ (Arrow pointing from left to right across Period 4)

7. Looking at period 4 of the Periodic Table (arrow), what is increasing as you move from left to right?

- A The atomic number
- B The number of subatomic particles
- C The number of valence electrons
- D All of the above

8. You need to identify a particular element. It may be found in Group 7A, Period 5. What is the atomic mass of this element (in amu)?

Record your answer in the space on your answer document.

9. A student observes some sugar as it is heated and burns. The student concludes that a chemical reaction has occurred. Which of the following observations about the burning sugar provides evidence of a chemical reaction?

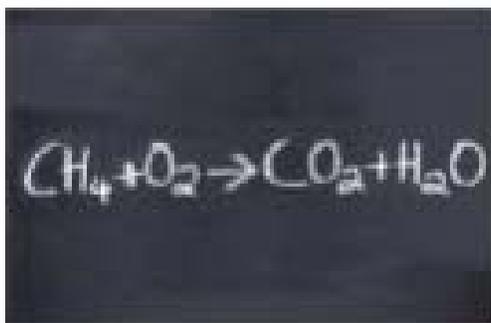
- A** Heat is added to the sugar crystals.
- B** The sugar melts and becomes a liquid.
- C** The temperature of the sugar increases.
- D** Gas is produced as the sugar turns black.

10. With respect to the Law of Conservation of Mass, what is the most accurate way to describe what happens to the atoms involved in a chemical reaction?

- F** The reactant atoms are destroyed, and new product atoms are formed.
- G** The reactant atoms are rearranged to form new compounds – the products.
- H** Nothing happens to the atoms during the reaction.
- J** Additional atoms are required in order to make the products.

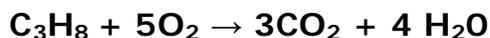
11. Look at the following chemical formula. $(\text{NH}_4)_2\text{CO}_3$
How many atoms of hydrogen (H) are found in this substance?

- A** 4
- B** 2
- C** 8
- D** 6



12. What is wrong with the chemical equation shown above?

F It is not complete.
G It is not balanced.
H It is actually a chemical formula.
D Nothing is wrong with the equation.

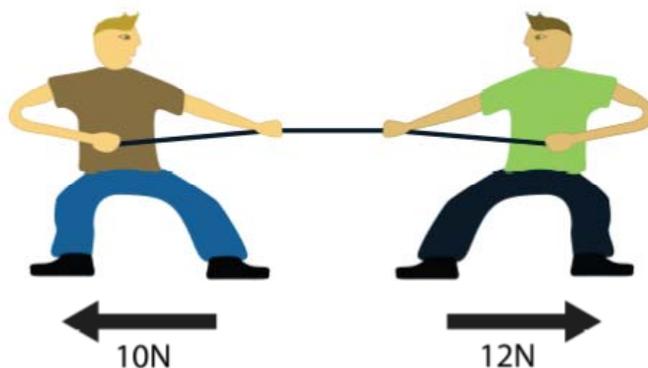


13. How many different elements are involved in the reaction shown above?

Record in your answer on the answer document.

14. How do certain elements play a role in deciding whether a compound is organic or inorganic?

F All compounds containing nitrogen are inorganic.
G All compounds containing chlorine are organic.
H All compounds containing helium are organic.
J All compounds containing carbon are organic.



15. Marcelo and Jesus are playing tug of war. Marcelo is pulling left on one end of a rope with 10N of force, while Jesus is pulling on the other end of the same rope with 12N of force. Who's pulling harder? How many Newtons harder is he pulling it?
- A Jesus, 12N Harder
 - B Jesus, 2N Harder
 - C Marcelo, 10N Harder
 - D Marcelo, 2N Harder

RC 2, 8.6A(R)

16. A race car driver completes a 250 mile race in about 2 hours. What was the driver's average speed in mph?

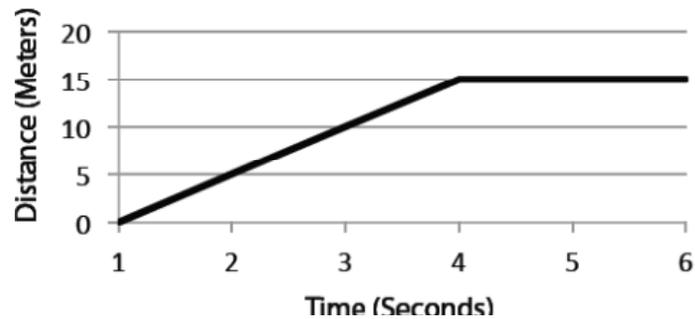
Record your answer on the answer document

RC 2, 8.6A(R)



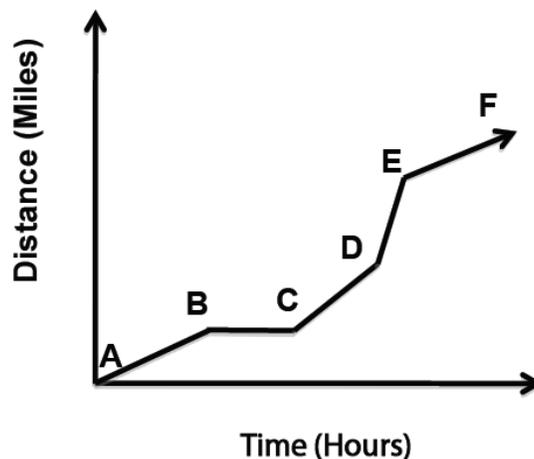
17. A student riding her bicycle stopped at the top of a hill. Which of the following is a true statement about the student and her bicycle once it starts rolling down the hill?
- A The student and her bicycle are acted on by friction and gravity.
 - B The student is acted on by friction, and her bicycle is acted on by gravity.
 - C The student and her bicycle are acted on by friction, but not gravity.
 - D The student and her bicycle are acted on by neither friction nor gravity.

Speed of a Ball



18. The graph above shows the distance traveled by a ball over a certain amount of time. What happened to the ball after 4 seconds?

- F The ball traveled at a constant speed.
- G The ball was accelerating.
- H The ball changed direction.
- J The ball stopped moving.



19. The graph above shows the motion of a car as it moved through city streets. Between which two points did the car have the greatest speed?

- A A to B
- B B to C
- C C to D
- D D to E

RC 2, 8.6C (R)

20. Victor kicked a 0.40 kg soccer ball with a force of 8 N, and Jose kicked a 0.20 kg soccer ball with a force of 4 N. Whose ball had the greater acceleration?
- F Victor
 - G Jose
 - H Their accelerations were the same
 - J None of the above

RC2, 8.6C (R)

Object	Mass	Acceleration
Soccer Ball	.40 kg	5 m/s ²
Tennis Ball	.055 kg	100 m/s ²
Marble	.015 kg	1000 m/s ²

21. Examine the table above. Which of the objects is producing the greatest force?
- A Soccer Ball
 - B Tennis Ball
 - C Marble
 - D Their accelerations are all equal

RC 2, 8.6C (R)

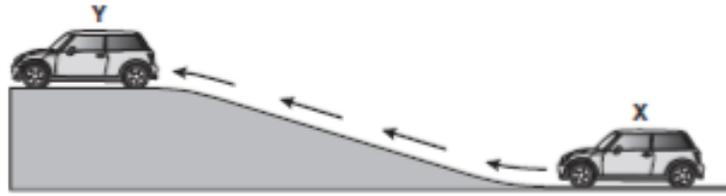
22. Newton's First Law is also called the Law of Inertia. Which of these scenarios is best explained by this law?

F A rocket that is propelled upward into space by gases pushing downward on Earth

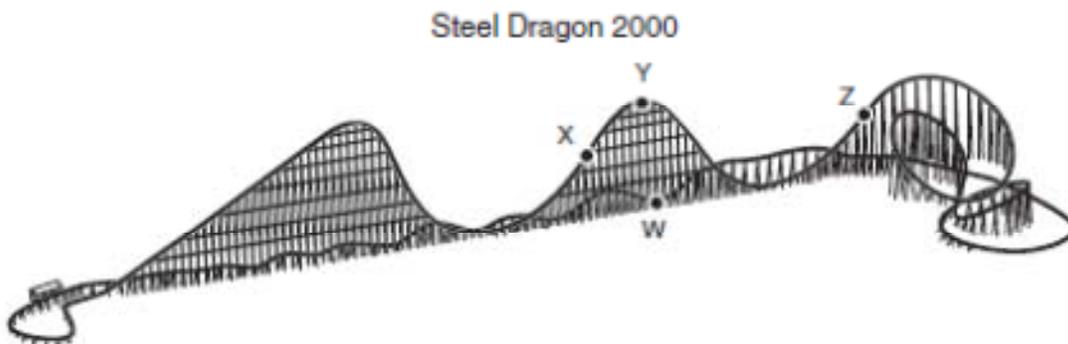
G Stopping a roller coaster cart suddenly can cause the passengers to be thrust forward into their seatbelts

H A TV was harder to move than a refrigerator because it had a smaller mass

J All of the above



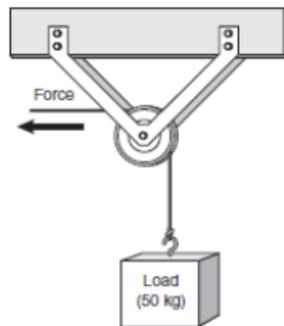
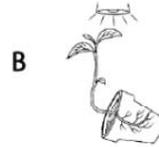
23. A gasoline-powered vehicle goes up a hill from point X to point Y. What energy transformation must occur in the car's engine?
- A** Chemical energy into mechanical energy
 - B** Electrical energy into chemical energy
 - C** Heat energy into chemical energy
 - D** Mechanical energy into nuclear energy



24. The drawing above shows a diagram of the Steel Dragon 2000, a roller coaster in Japan. It is one of the longest roller coasters in the world. At which point on the roller coaster would a rider have the greatest gravitational potential energy?
- F** W
 - G** X
 - H** Y
 - J** Z



25. Which of the following shows how the plant would grow if set on its side and left for two weeks? **A**

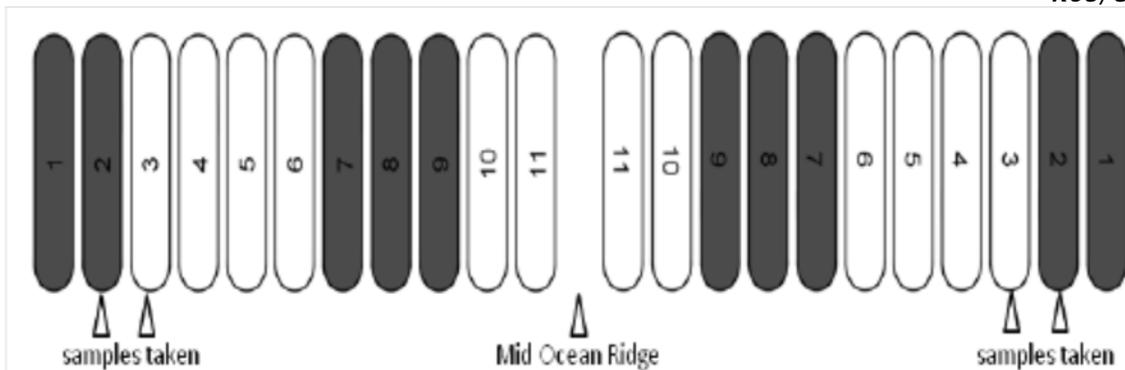


26. The picture above shows a pulley being used to move a load. In which direction will the load move if the force applied to the rope is greater than the force of gravity on the load?

- F** Right
- G** Left
- H** Up
- J** Down



27. A scientist found fossils of the same tropical fern in Africa, Antarctica, and Australia. What conclusion can the scientist make?
- A** The fern can live in any climate.
 - B** Birds who eat the fern also live in Africa, Antarctica, and Australia.
 - C** More evidence is needed to make a good conclusion.
 - D** The continents have moved.



28. A geologist studying the bottom of the ocean found rocks at positions 2 and 3 of the same type and age on either side of a ridge. What is this evidence of?
- F** Continental drift
 - G** Global warming
 - H** Mountain building
 - J** Seafloor spreading

29. A tectonic plate of oceanic crust is colliding with a plate of continental crust. What type of crustal features may form?

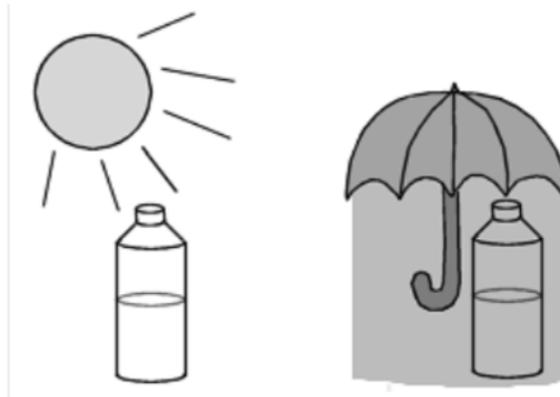
- A Volcanic mountain range
- B A crescent of volcanoes and volcanic islands
- C A mountain range with no volcanoes
- D A displaced area of transform faults

RC3, 8.6C (R)

30. What would you look for in a series of topographic maps to determine that erosion has occurred?

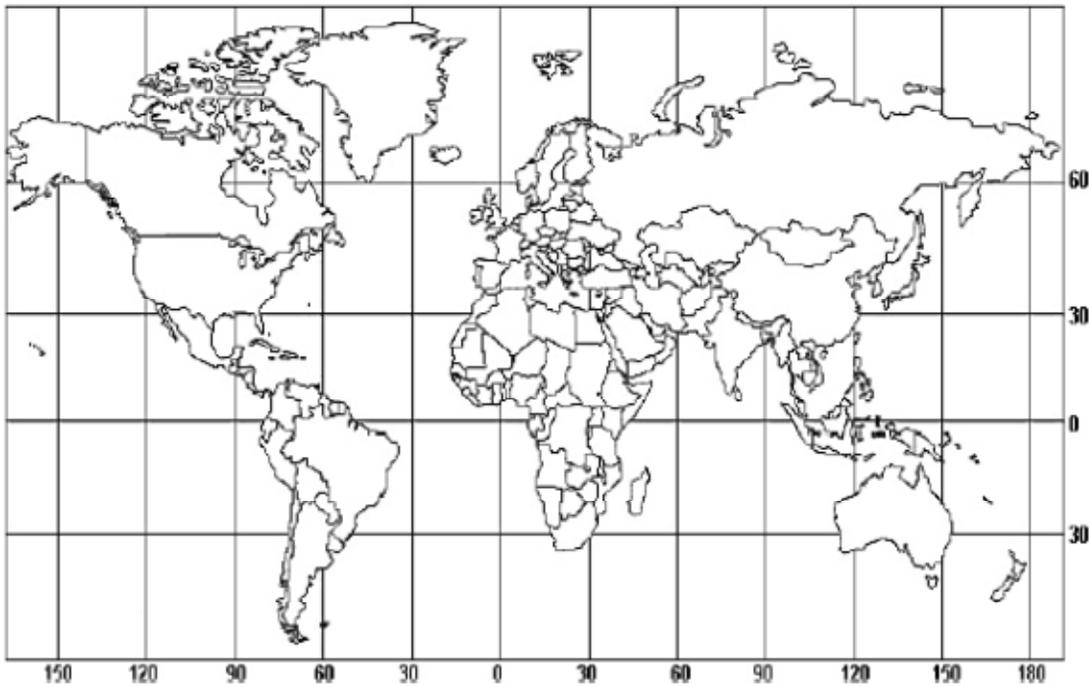
- F A widening of the spaces between contour lines
- G A crossing of contour lines
- H Indication of water
- J Wind speed and direction values

RC 3, 6.9A (S)



31. One student left a bottle of water in the direct sunlight; another student left a bottle of water in the shade. Why was the water left in the sunlight a different temperature from the bottle left in the shade?

- A The water in the sunlight absorbed more thermal energy.
- B The water in the shade absorbed more thermal energy.
- C The bottle in the shade was glass and the bottle in the sunlight was plastic.
- D The water in the shade was cooler because it conducted heat to the bottle.



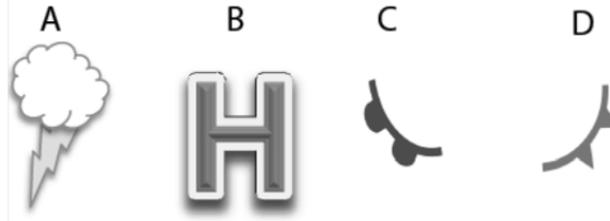
32. A student traveling on a cruise ship across the Atlantic Ocean tosses a bottle with a note overboard. The ship was sailing at 40° latitude. What prediction can the student make about the bottle?

F The ocean currents caused by the westerly winds will carry the bottle towards Europe.

G The ocean currents caused by the westerly winds will carry the bottle towards North America.

H The deep ocean currents will carry the bottle south to Antarctica.

J The deep ocean currents will carry the bottle north to Greenland.



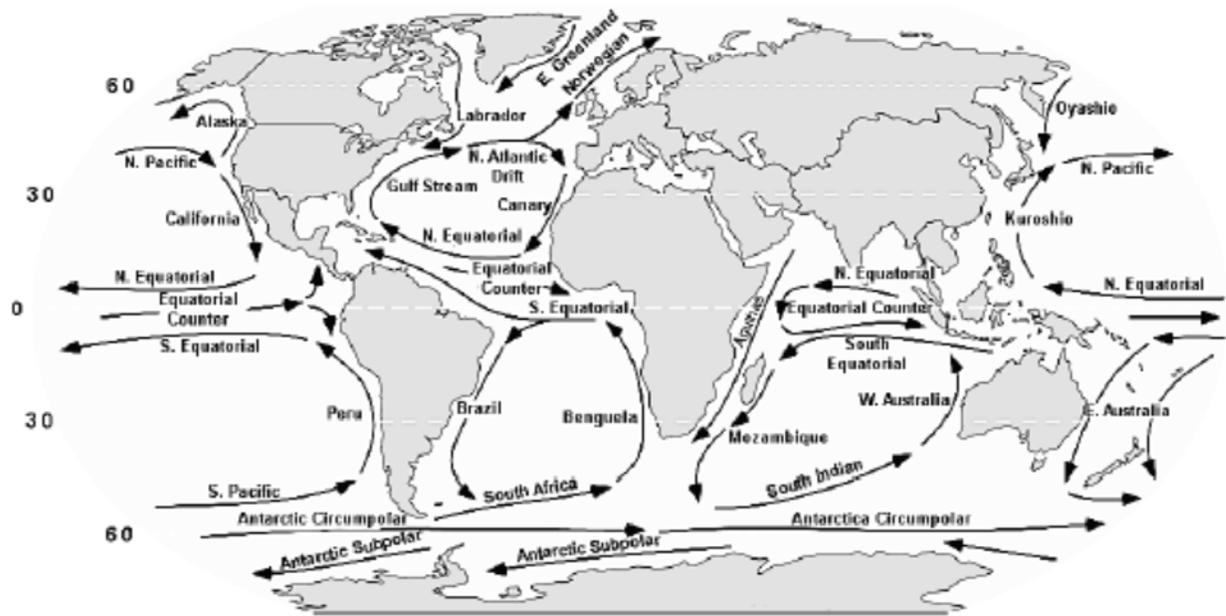
33. A student is drawing a weather map. An area of low pressure is moving up from the Gulf Coast and overriding colder air. How should this be marked on the map?

- A** Small pictures of thunderstorms
- B** A large letter, H, for hot or warm
- C** A frontal boundary line with red half circles
- D** A frontal boundary line with blue triangles

RC 3, 8.10C (S)

34. An area of low pressure has formed in the Texas Gulf. News reports concerning the warm surface temperatures of the ocean water and the rotational movement of the clouds are announced hourly. What may be forming?

- F** A blizzard
- G** A tornado
- H** A hurricane
- J** El Nino

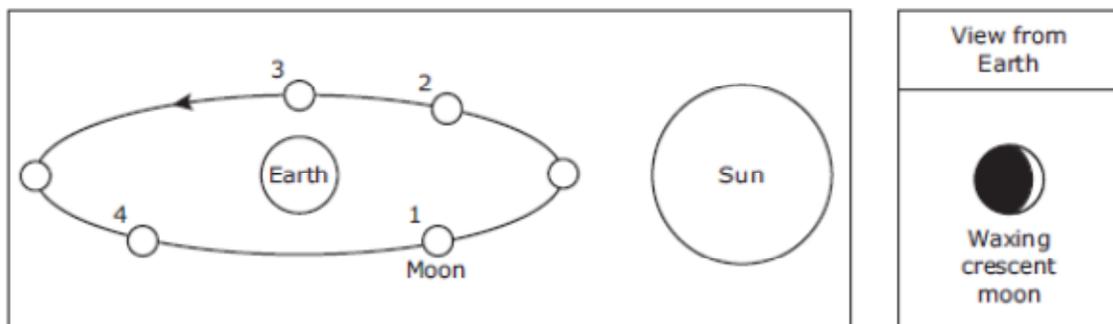


35. Stavanger, Norway has a warmer climate than the rest of Norway. What could cause this?

- A Stavanger is the southernmost city.
- B The Gulf Stream current carries warm water to the Stavanger area.
- C The Arctic current carries cold water toward Norway.
- D There is no sea ice in the region to create the cold, deep ocean currents.

36. Earth's land areas, oceans, and atmosphere maintain fairly constant average temperatures. What is the best explanation for these constant average temperatures?

- F** Earth's Northern Hemisphere and Southern Hemisphere have opposite seasons.
- G** Earth is tilted and rotates daily on its axis.
- H** The continuous motion of air and water distributes the sun's energy.
- J** Global weather systems generally move from west to east.



37. The diagram above shows the orbit of the moon around Earth. At which point in the moon's orbit will a person standing on Earth see a waxing crescent moon?

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

38. As a river enters a larger body of water, sediments are deposited over a wide area. Which of these landforms is likely to be formed at the site of deposition?

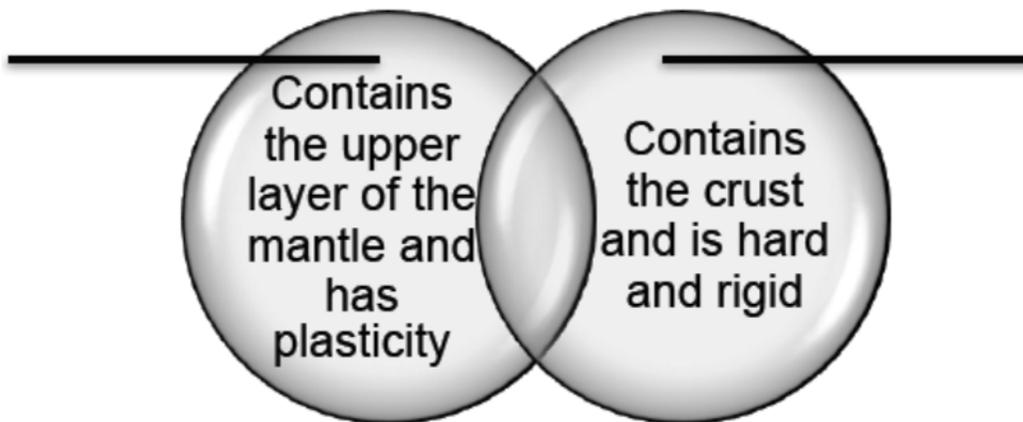
- F Cave
- G Mountain
- H Delta
- J Valley

RC 3, 6.11A (S)

39. At certain times of the year, meteor showers can be observed from Earth. Why are these objects from space usually harmless?

- A They are always microscopic.
- B They are closer to the sun than to Earth.
- C They are made of soft, spongy materials.
- D They burn up high in Earth's atmosphere.

RC 3, 6.10A (S)



40. What would be the best title for the LEFT portion of the Venn Diagram?

- F Outer core
- G Lithosphere
- H Asthenosphere
- J Atmosphere

Mangrove trees have special roots that let them live in the somewhat salty water where rivers meet the ocean. These roots collect sediments, debris, and mud. This gradually helps coastlines stretch farther into the sea. Forests of mangrove trees also provide shelter for wildlife.

41. The high winds of hurricanes and typhoons often destroy mangrove forests. The destruction of these forests most likely affects ecosystems by —
- A reducing beach erosion in sea-turtle nesting areas
 - B reducing the amount of saltwater flowing into lakes
 - C causing pollution in inland rivers and streams
 - D forcing migratory birds to find other places to rest

Birds Living in Plant Layers
in a Texas Ecosystem

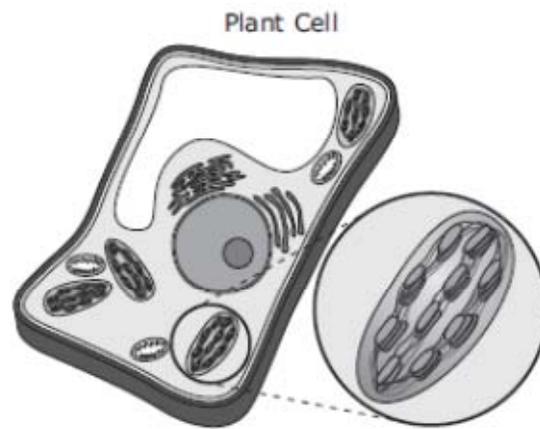
Location of Layer	Birds Found Within Layer
Above tree level	Vultures, hawks, swallows, swifts
Treetops	Owls, woodpeckers, thrushes, warblers
Middle of trees	Jays, chickadees, vireos
Shrubs, small trees, and plants	Mockingbirds, cardinals, wrens, doves

Source: Texas Parks and Wildlife Department

42. The table above shows where some birds in a Texas ecosystem are located within the layers of plants in their environment. These layers begin at the ground and end in the area above the treetops. Which of these would most likely occur if a wildfire destroyed all the plants in the lowest level of this ecosystem?

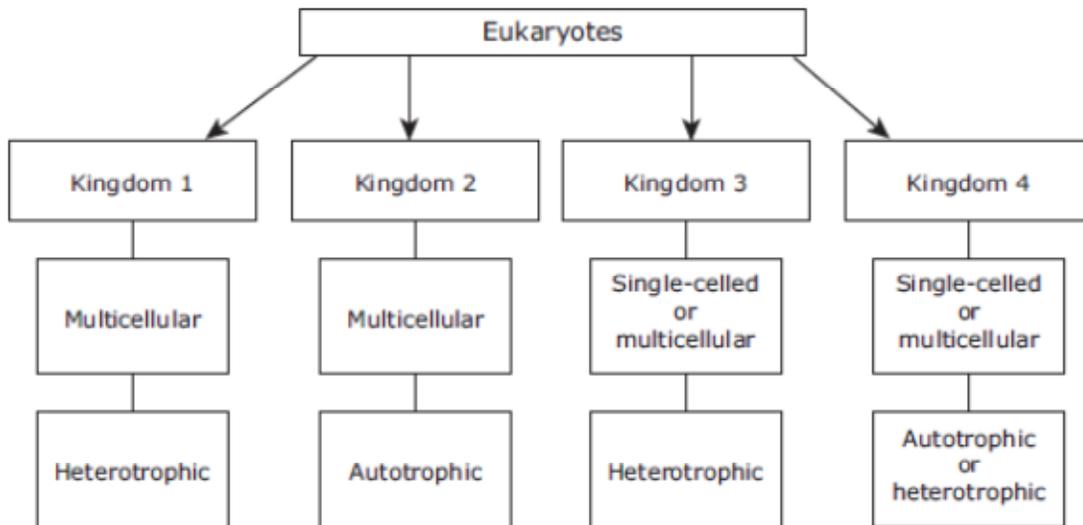
- F Vireos would begin to nest on the ground.
- G Doves would have to move to a different area to find food.
- H Hawks would begin to hunt for animals in the middle level.
- J Cardinals would move to above tree level and begin competing with hawks.

A diagram of a plant cell is shown below.



43. The function of the plant cell structure shown in the enlargement is to —
- A** provide support for the cell
 - B** direct all the cell's activities
 - C** use energy from sunlight to make sugar
 - D** regulate substances that enter and exit the cell

44. Eukaryotes are classified into four kingdoms according to certain characteristics. The diagram below shows some characteristics of the four kingdoms.



Which of these is the plant kingdom?

- F Kingdom 1
- G Kingdom 2
- H Kingdom 3
- J Kingdom 4

45. A cook touches a hot stove and quickly moves his hand away. What are the two primary body systems that work together to produce this response?
- A Integumentary and endocrine systems
 - B Muscular and respiratory systems
 - C Nervous and muscular systems
 - D Skeletal and nervous systems

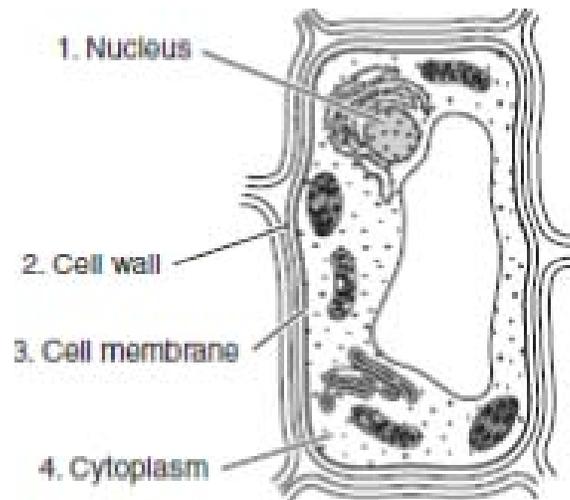
46. In a healthy forest, dead trees and limbs fall to the ground and decompose. Which of these statements best describes why decomposition is important to a forest ecosystem?

F Nutrients are released when wood is broken down.

G Worms produce oxygen used by other organisms.

H Dead trees provide nest sites for many different species of birds.

J Water is stored in dead trees and limbs.



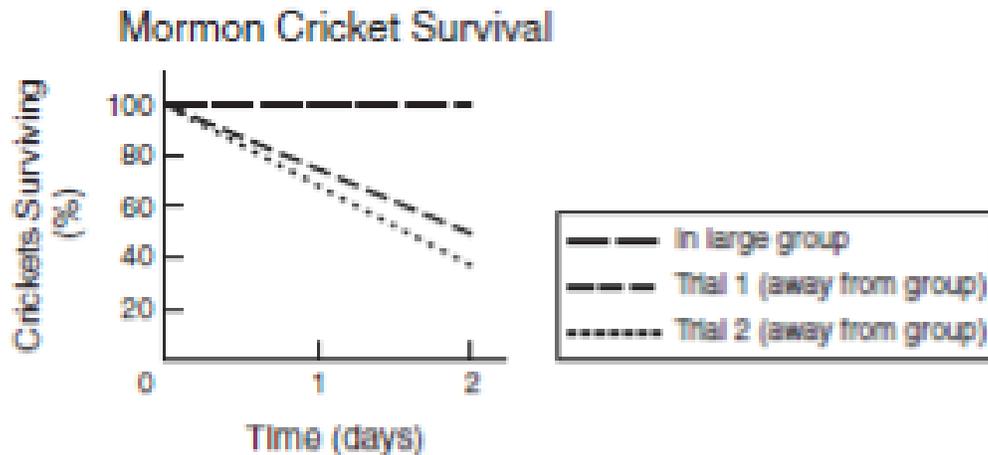
47. Which numbered part of the plant cell shown above primarily provides support for the plant's structure?

A 1

B 2

C 3

D 4

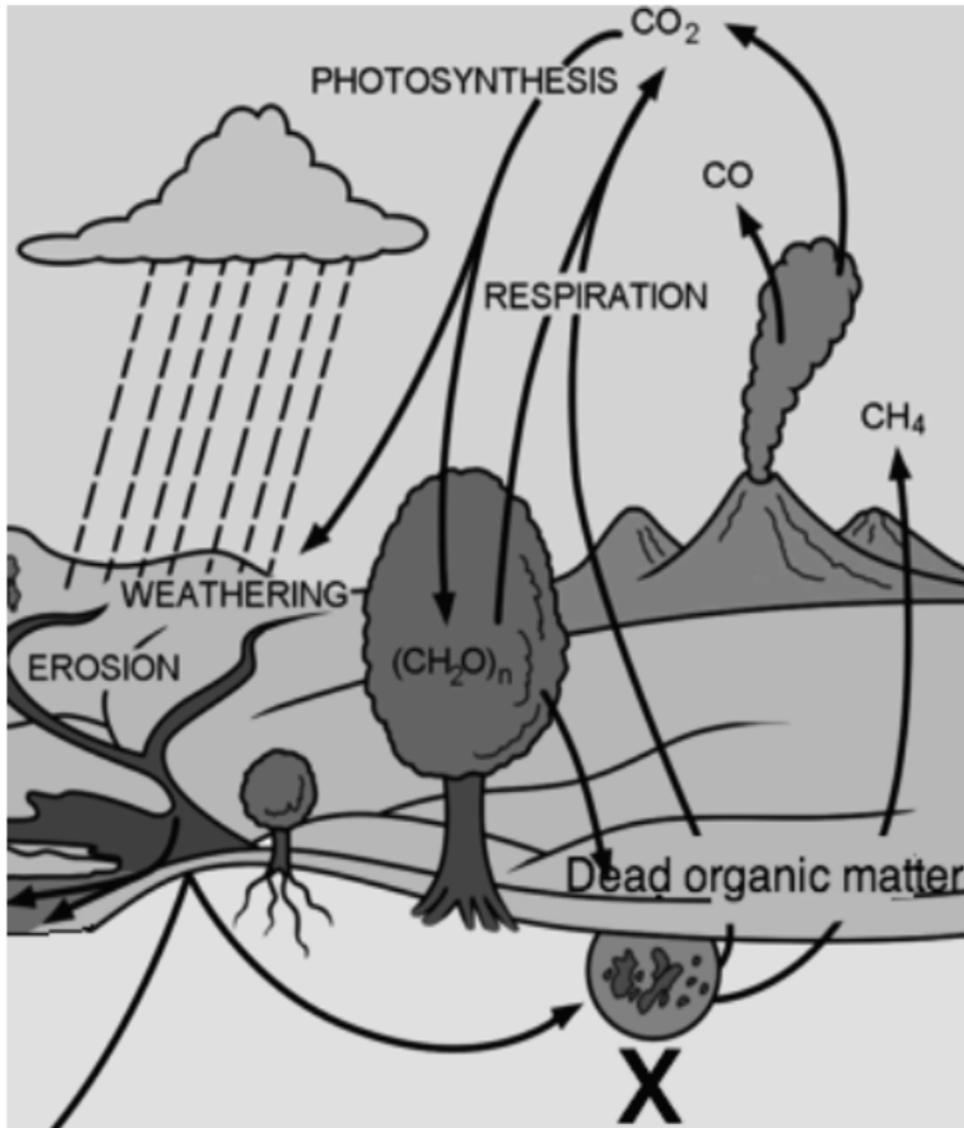


48. Flightless Mormon crickets often move in large groups. The graph shows the survival rate of crickets moving in large groups and of some crickets that were moved away from the groups. Which of these inferences about Mormon crickets is most likely accurate?

F Mormon crickets within a group survive only two days.
G Mormon crickets away from a group successfully reproduce.
H Mormon crickets away from a group return to it for protection.
J Mormon crickets within a group are less likely to be eaten by predators.

49. The petals of flowers often are brightly colored. These petals provide a benefit for the plant because they —

A prevent insects from taking pollen to other flowers
B hide the plant from predators that would eat its flowers
C protect the leaves from injury by birds and insects
D attract insects that can carry the pollen needed for plant reproduction

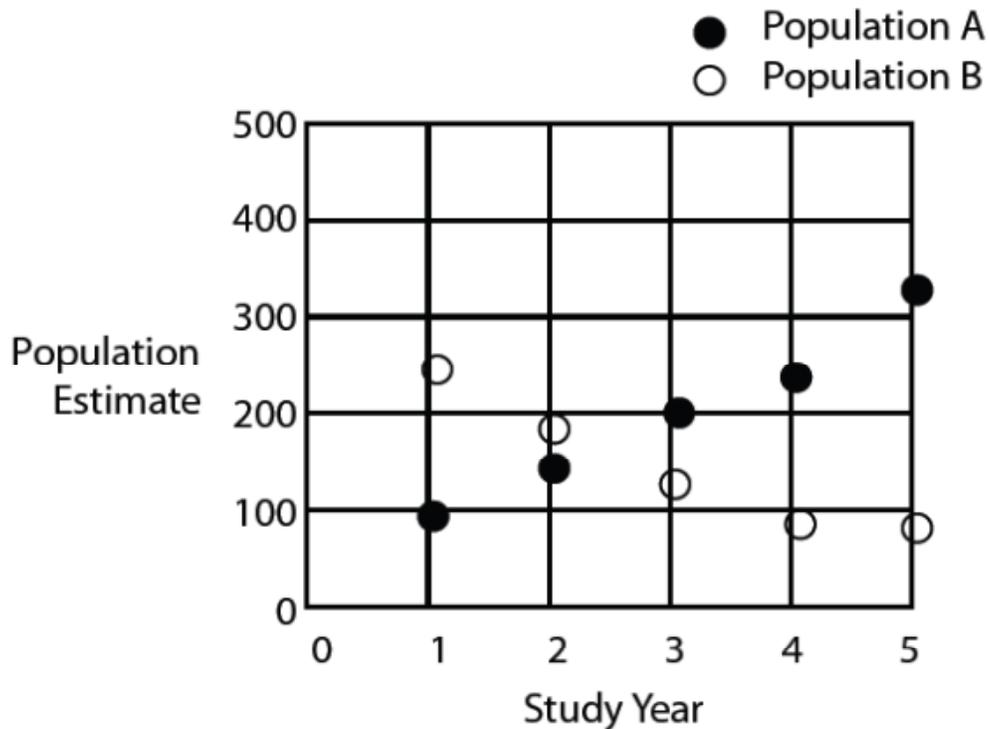


RC 4, 7.

50. Organisms responsible for the breakdown of matter indicated by the letter "X" in the diagram above would include -

- F** animals and plants
- G** plants and bacteria
- H** bacteria and fungi
- J** fungi and plants

RC 4, 7.11B



51. Maria collects the above data on two overlapping populations of what she believes is the same species of rodent. Both populations eat primarily the same food resources. During the same study period, Maria found an increasing number of hawk nests in the area while food resources remained the same. Based on her findings, which of the following statements is most likely accurate?

- A** Population A was better adapted to avoid predation by hawks.
- B** Population A was better adapted for collecting food resources.
- C** Answers A and B
- D** Survival of Population A and Population B is not dependent on either food or predation factors.

RC 4, 7.13A (S)

52. Organisms are confronted with external stimuli in their environment respond to such stimuli internally. Which of the following correctly identifies an external stimulus that triggers an internal response?

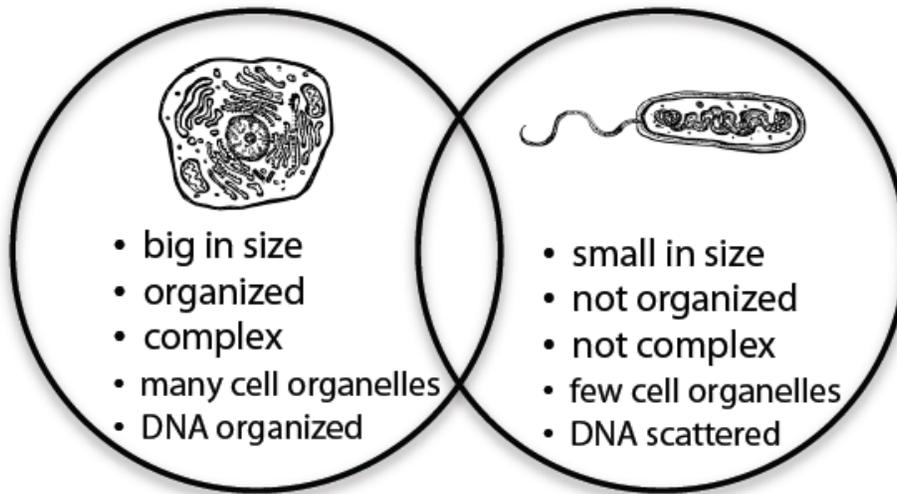
- F** Hunger causes eating food
- G** Thirst causes drinking water
- H** Fever causes sweating
- J** Being frightened causes muscles to tense

RC 4, 7.14B (S)

53. An aspen tree can reproduce sexually and asexually. Under what conditions would asexual reproduction be the most successful strategy?

- A** In an open area with lots of light
- B** In a crowded and challenging environment
- C** In an environment with many different micro-climates and high biodiversity
- D** In an area that changes frequently, favoring adaptation to the new environment

RC 4, 6.12B (S)



54. When comparing a prokaryotic and eukaryotic cell, the eukaryotic cell can be described as –

- F** simple, performing limited functions
- G** relatively small in size and unorganized
- H** complex and well-developed
- J** lacking structured DNA and organelles

STAAR GRADE 8 SCIENCE REFERENCE MATERIALS



FORMULAS

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$D = \frac{m}{V}$$

$$\text{Average speed} = \frac{\text{total distance}}{\text{total time}}$$

$$s = \frac{d}{t}$$

$$\text{Net force} = (\text{mass})(\text{acceleration})$$

$$F = ma$$

$$\text{Work} = (\text{force})(\text{distance})$$

$$W = Fd$$
