

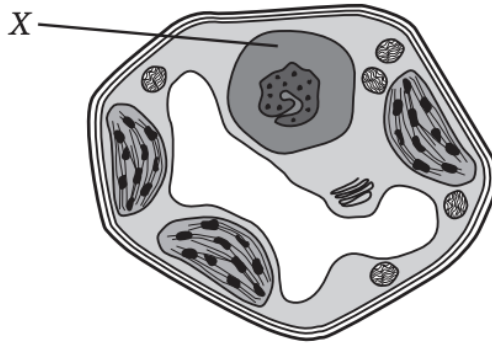
**Natural Science Discipline**  
**Category 3 - Sample Questions**

1. Which of the following can provide the human body with long-term immunity against some diseases?
  - A. Antibiotics
  - B. Drip solutions
  - C. Vaccines
  - D. Vitamins
  
2. Bacteria that enter the body are destroyed by which type of cells?
  - A. Lung cells
  - B. Kidney cells
  - C. Red blood cells
  - D. White blood cells
  
3. Which of the following best describes the purpose of cellular respiration?
  - A. To release oxygen for breathing
  - B. To provide energy for cell activities
  - C. To produce sugar for storage in cells
  - D. To supply carbon dioxide for photosynthesis
  
4. Twins are born. One is a boy, and one is a girl. Which statement is correct about their genetic makeup?
  - A. The boy and girl inherit genetic material from both parents.
  - B. The boy and girl inherit genetic material from the father only.
  - C. The boy and girl inherit genetic material from the mother only.
  - D. The boy inherits genetic material from the father only and the girl inherits it from the mother only.
  
5. The following table shows the classification of some animals into two categories.

Category 1	Category 2
rabbit	frog
giraffe	spider
elephant	lion

- Which of the following was used to classify these animals?
- A. Food source
  - B. Pattern of movement
  - C. Method of reproduction
  - D. Organs used in breathing
- 
6. Which equation summarizes the process of respiration?
    - A.  $\text{water} + \text{carbon dioxide} + \text{energy} \rightarrow \text{sugar} + \text{oxygen}$
    - B.  $\text{oxygen} + \text{sugar} \rightarrow \text{carbon dioxide} + \text{water} + \text{energy}$
    - C.  $\text{carbon dioxide} + \text{oxygen} + \text{water} \rightarrow \text{sugar} + \text{energy}$
    - D.  $\text{sugar} + \text{carbon dioxide} + \text{energy} \rightarrow \text{oxygen} + \text{water}$

7. The diagram shows a plant cell.



What is the function of the part of the cell labeled X?

8. Analyze the diagrams below.

Diagram 1

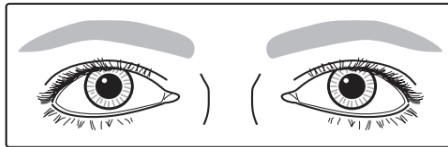
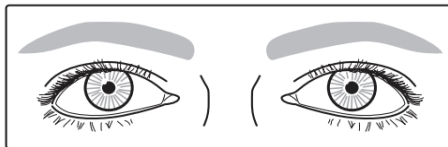


Diagram 2



Diagrams 1 and 2 illustrate the same pair of eyes that have reacted to a change in an environmental condition.

What is the environmental condition and how is it different for the eyes in Diagram 1 and 2?

9. In the diagrams below, hydrogen atoms are represented by white circles, and oxygen atoms are represented by black circles. Which of the diagrams best represents water?

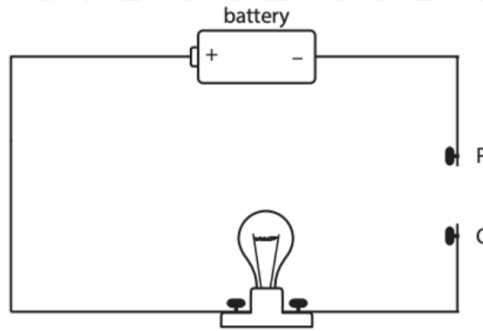
A.

B.

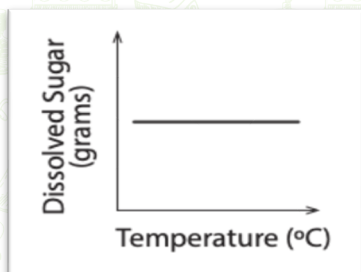
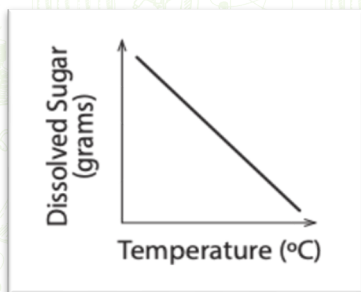
C.

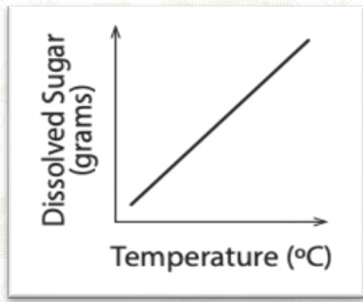
D.

10. Rods made of different materials are connected between points P and Q in the circuit diagram shown below.

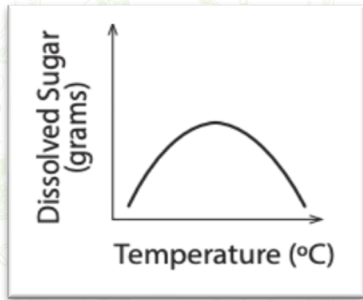


- Which rod would cause the bulb to light?
- Glass rod
  - Wood rod
  - Plastic rod
  - Copper rod
11. The chemical formula for sulfuric acid is  $\text{H}_2\text{SO}_4$ . How many atoms are there in a molecule of sulfuric acid?
- 3
  - 5
  - 7
  - 9
12. Bob did an experiment to investigate the effect of temperature on the solubility of sugar in water by measuring the amount of sugar that would dissolve in 1 liter of water at different temperatures. He then plotted his results. Which of the following is likely to be the graph showing Bob's results?



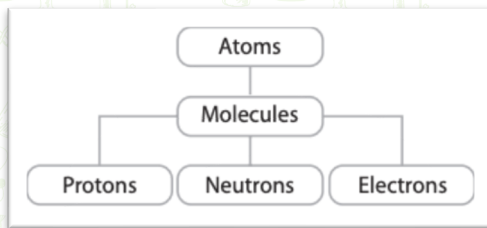


C.

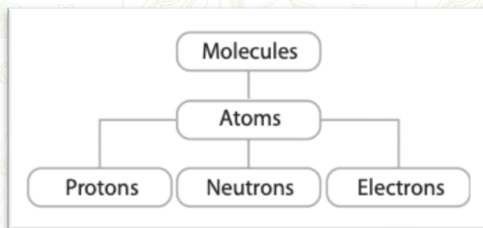


D.

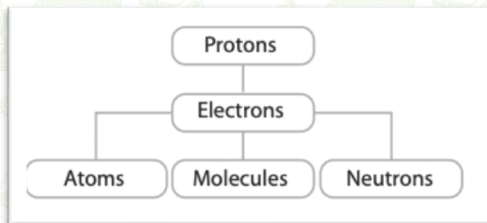
13. Which of these diagrams best represents the structure of matter, starting with the more complex particles at the top and ending with the more fundamental particles at the bottom?



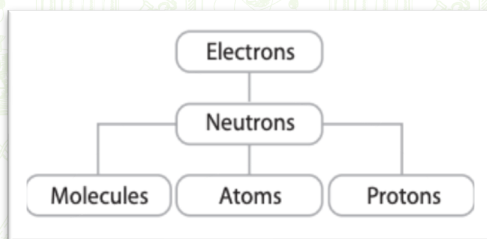
A.



B.

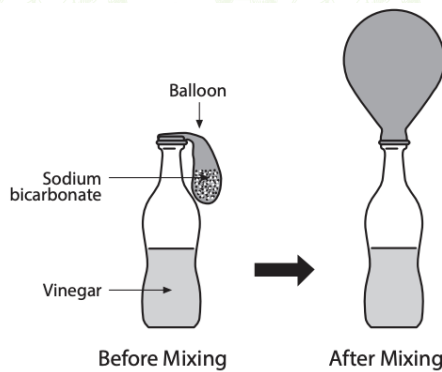


C.



D.

14. Robert put two drops of an indicator into vinegar, and the color turned red. He then added drops of ammonia solution until the color disappeared. What process occurred?
- Evaporation
  - Neutralization
  - Oxidation
  - Sublimation
15. As shown in the diagram, the balloon inflates when the sodium bicarbonate in the balloon is mixed with the vinegar.



Provide an explanation on what causes this to happen.

16. Study the periodic table of elements given below.

**PERIODIC TABLE OF THE ELEMENTS**

GROUP IA (1)																																GROUP IIB (8)															
1																																2															
H																																He															
1.0079																																4.0026															
3		4																		5		6		7		8		9		10																	
Li		Be																		B		C		N		O		F		Ne																	
6.941		9.012																		10.811		12.01		14.007		16.00		19.00		20.179																	
11		12																		13		14		15		16		17		18																	
Na		Mg		IIIA (3)		IVA (4)		VA (5)		VIA (6)		VIIA (7)		VIII (8)		IB (1)		IIB (2)		III (3)		IV (4)		V (5)		VI (6)		VII (7)		VIII (8)																	
22.99		24.30		22.99		24.30		44.96		47.90		50.94		52.00		54.938		55.85		58.93		58.69		63.55		65.39		69.72		72.59		74.92		78.96		79.90		83.80									
19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36													
K		Ca		Sc		Ti		V		Cr		Mn		Fe		Co		Ni		Cu		Zn		Ga		Ge		As		Se		Br		Kr													
39.10		40.08		44.96		47.90		50.94		52.00		54.938		55.85		58.93		58.69		63.55		65.39		69.72		72.59		74.92		78.96		79.90		83.80													
37		38		39		40		41		42		43		44		45		46		47		48		49		50		51		52		53		54													
Rb		Sr		Y		Zr		Nb		Mo		Tc		Ru		Rh		Pd		Ag		Cd		In		Sn		Sb		Te		I		Xe													
85.47		87.62		88.91		91.22		92.91		95.94		(98)		101.1		102.91		106.42		107.87		112.41		114.82		118.71		121.75		127.60		126.91		131.29													

Element	Symbol
Argon	Ar
Chlorine	Cl
Helium	He
Nitrogen	N
Zinc	Zn

Based on its location on the partial periodic table shown above, which element would you predict has chemical properties that are most similar to argon (Ar)?

17. During which chemical process is energy absorbed?
- Candles burning
  - Iron nails rusting
  - Vegetables rotting
  - Plants photosynthesizing

18. Larvae and pupae normally float. They must use their muscles in order to dive down through water. What type of energy is used by the muscles?
- Sound energy from the air
  - Thermal energy from the water
  - Chemical potential energy from their cells
  - Gravitational potential energy from Earth
19. Which of the following energy conversions takes place in a battery-operated flashlight?
- Electrical → mechanical → light
  - Chemical → mechanical → light
  - Chemical → electrical → light
  - Nuclear → electrical → light
20. The figure shows a parachute jumper in four positions.



1. In the aircraft before the jump



2. In freefall immediately after jumping before parachute opens



3. Falling to the ground after the parachute opens

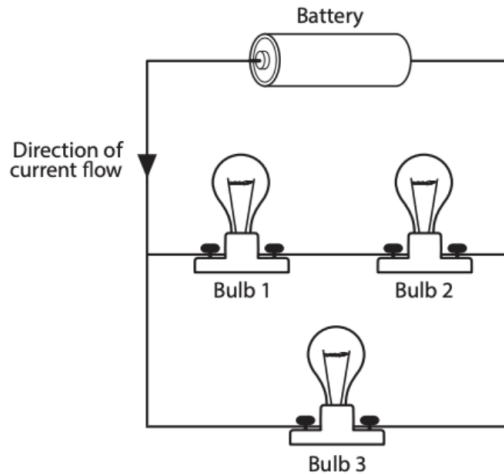


4. On the ground just after landing

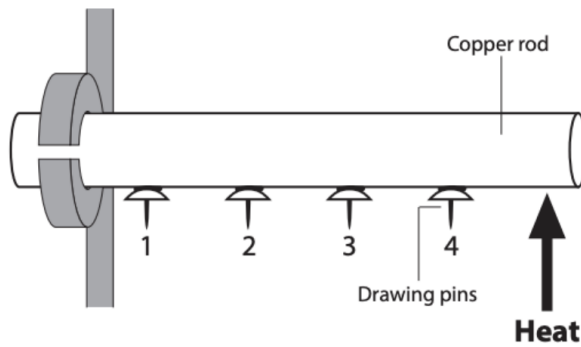
In which of the positions does the force of gravity act on the jumper?

- Position 2 only
  - Positions 2 and 3 only
  - Positions 1, 2, and 3 only
  - All positions
21. A gas is heated and its temperature increases. What happens to the gas molecules?
- They get bigger.
  - They move faster.
  - They move slower.
  - They increase in number.

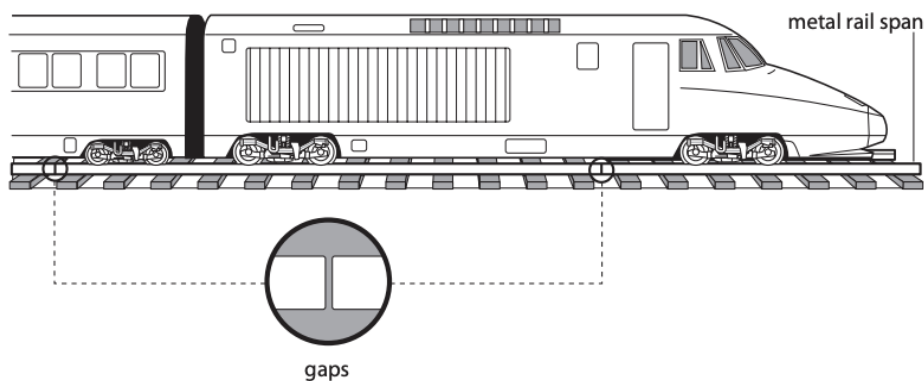
22. Three identical bulbs are connected to a battery as shown in the diagram. The arrow indicates the direction of the current flow.



- A. The current in Bulb 1 is greater than the current in Bulb 2.
  - B. The current in Bulb 1 is greater than the current in Bulb 3.
  - C. The current in Bulb 2 is the same as the current in Bulb 3.
  - D. The current in Bulb 2 is the same as the current in Bulb 1.
23. A student attaches four drawing pins to a copper rod using candle wax as shown in the diagram. The rod is then heated continuously at one end and the pins fall off in the order 4, 3, 2, 1.



- By which heat transfer method does heat reach the pins?
24. Explain why some railroad tracks are laid down with gaps between the metal rail spans.



25. A farmer planted a field of corn. Weeds started to grow among the seedlings. What ecological relationship is most likely to exist in this scenario?
- A. Commensalism
  - B. Competition
  - C. Mutualism
  - D. Predation

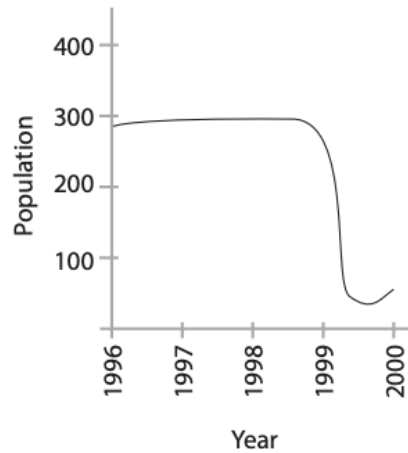
26. Where did organisms live when they first appeared on Earth?
- In the air
  - In the water
  - On the land
  - Under the ground
27. Which of the following statements is true about organisms that are producers?
- They absorb energy from a host animal.
  - They get energy from eating living plants.
  - They use energy from the sun to make food.
  - They get energy by breaking down dead plants and animals
28. In a lake near a farm the growth of algae suddenly increased. This increase was most likely due to which of the following?
- A decrease in water level
  - A decrease in air temperature
  - Fertilizer runoff from the farm
  - Exhaust gases from farm equipment
29. The diagram below shows geological layers of rock containing fossils. Layer F is the uppermost layer, while Layer A is the deepest layer.



- Which statement about the age of the fossils is most likely correct?
- Fossils in Layer A are the oldest because they are located in the deepest layer.
  - Fossils in Layer C are the youngest because they look similar to existing organisms.
  - Fossils in Layer D are older than fossils in Layer A, because the fossils in Layer D are bigger.
  - Fossils in Layer E are the same age as those in Layer F because they look the same.



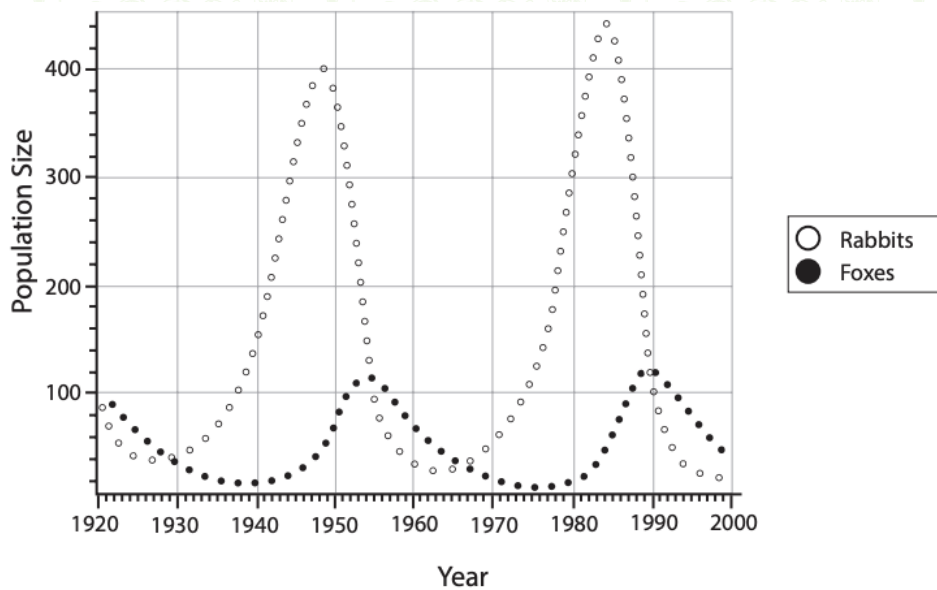
30. The graph indicates the number of antelopes in a certain area over a period of time.



Which of the following factors is mostly like to have caused the sudden change in population between 1999 and 2000?

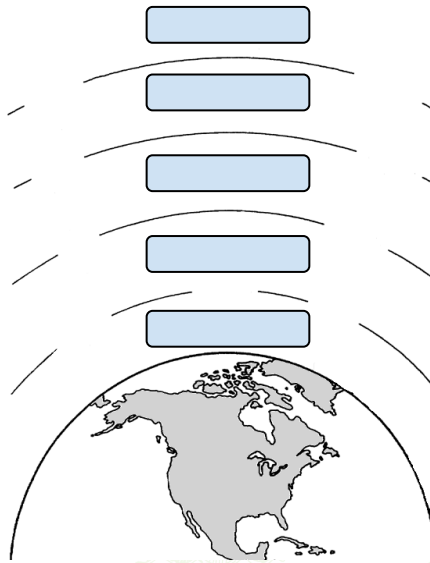
- A. Global warming
- B. Absence of predators
- C. Depletion of the ozone layers
- D. Brush fires that destroyed the food supply

31. A population of rabbits and foxes live in a remote area. The foxes do not have any predators. Scientists counted the number of rabbits and foxes over a long time period and plotted their results, as shown below.



Explain how the changes in population size of rabbits and foxes are related.

32. Label the layers of the atmosphere.



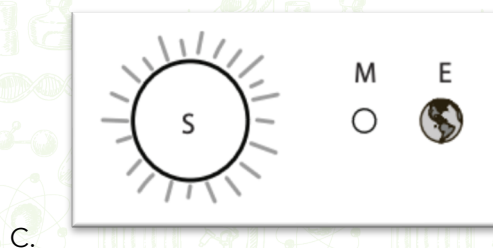
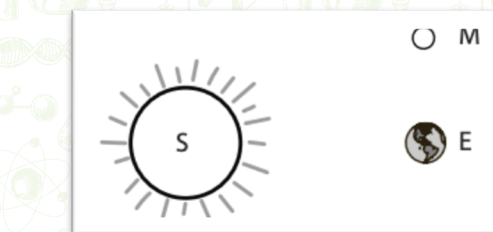
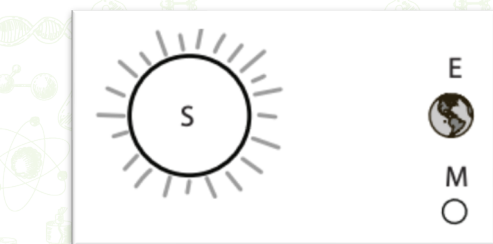
33. Which of the following is the major cause of tides?

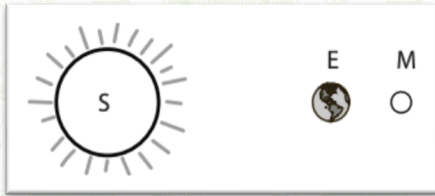
- A. Changes in wind direction
- B. Gravitational pull of the Moon
- C. Earthquakes on the ocean floor
- D. Heating of the oceans by the Sun

34. What is the main difference between planets and moons in our solar system?

- A. All planets are larger than all moons.
- B. All planets can support life; moons cannot.
- C. All planets have atmospheres; moons do not.
- D. All planets orbit the Sun; all moons orbit planets.

35. Which diagram shows the position of the Sun (S), moon (M), and Earth (E) during an eclipse of the moon?



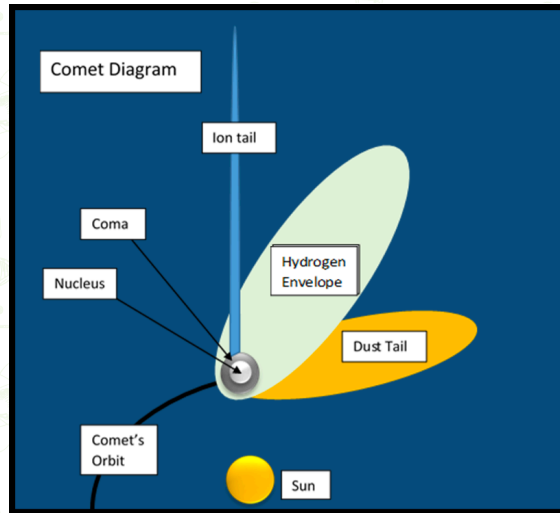


- D.
36. Currently, the Sun is in its \_\_\_\_\_ stage of life. Its last phase of life will be when it is a \_\_\_\_\_ star.
- Nebulous, red giant
  - Yellow giant, white dwarf
  - White dwarf, main sequence
  - Main sequence, white dwarf
37. How do annular solar eclipses occur?
- Moon falls under Earth's umbra.
  - Moon falls under Earth's antumbra.
  - Moon falls under Earth's penumbra.
  - Moon casts an antumbral shadow on Earth.
38. Which of the following classifications of galaxies contains stars that are mostly old?
- Cylindrical galaxy
  - Elliptical galaxy
  - Irregular galaxy
  - Spiral galaxy
39. Below is a photo of the NGC 4449 galaxy captured by the Hubble space telescope.



What type of galaxy is NGC 4449 galaxy?

40. How does the ion tail of a coma form?



41. Which type of cell is shown in the image below?

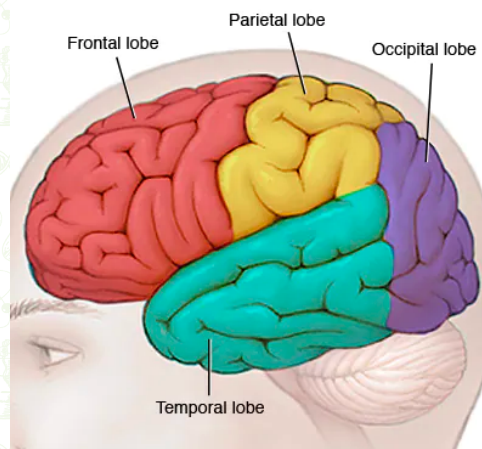


- A. Bone cell
- B. Nerve cell
- C. Sex cell
- D. Stem cell

42. When did dinosaurs first appear?

- A. Cretaceous
- B. Jurassic
- C. Permian
- D. Triassic

43. Below is an image of the different lobes of the brain.



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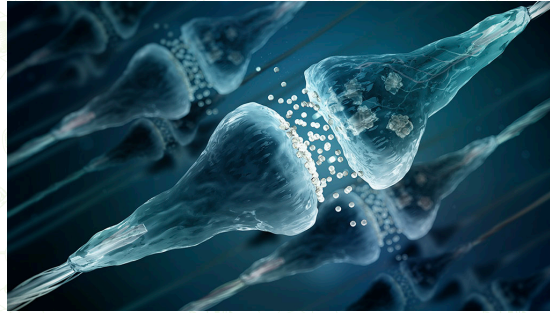
Which of the following has an important role in vision because they allow us to make sense of information that comes from our eyes?

- A. Frontal lobe
- B. Occipital lobe

- C. Parietal lobe
- D. Temporal lobe

44. What mass extinction event caused the complete disappearance of nonavian dinosaurs?
- A. Triassic-Jurassic
  - B. Permian-Triassic
  - C. Ordovician-Silurian
  - D. Cretaceous-Tertiary

45. Neurons do not touch one another, but what happens when a neuron comes closer to another neuron? Explain what this is called and how neurons communicate with one another.

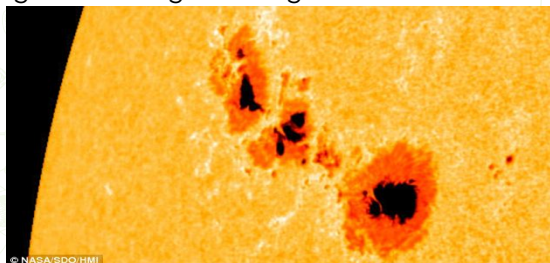


46. Below is an image that shows tracks in rock at Dinosaur Ridge, Morrison Fossil Area, Jefferson County, Colorado.



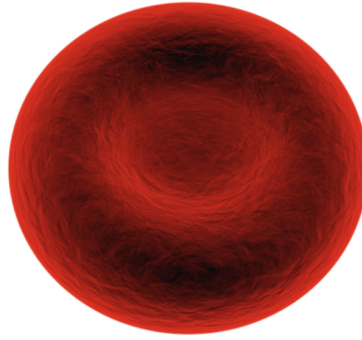
What kind of fossil is shown in the given image?

47. What solar feature is highlighted in the given image of the sun below?



- A. Prominences
- B. Solar flare
- C. Solar wind
- D. Sunspots

48. The shape of the red blood cells is in discoidal form. It also has an indentation in the center.



What could be the best explanation for this structure of the red blood cell?

- A. It is for faster transport in the blood.
  - B. It is due to the absence of the nucleus.
  - C. It is due to the presence of hemoglobin.
  - D. It is due to the lack of genetic materials inside the cell.
49. Which of the following materials is **not** transported by the blood?
- A. Fatty acids
  - B. Gases
  - C. Proteins
  - D. Starch
50. Which is known as the control center of the cell?
- A. Lysosome
  - B. Mitochondria
  - C. Nucleus
  - D. Ribosome
51. Element X has an atomic number of 17 and mass number of 35. How many protons does it have?
- A. 16
  - B. 17
  - C. 18
  - D. 35
52. What separation technique of mixture is shown in the image below?



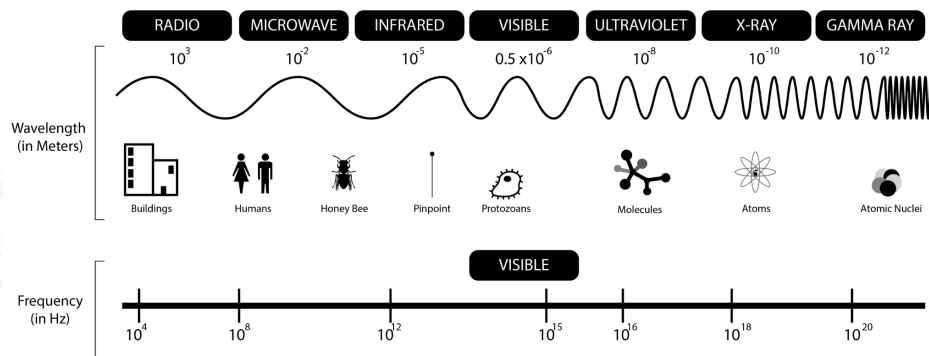
- A. Centrifugation
- B. Decantation
- C. Evaporation
- D. Filtration

53. What is the totality of genes, species, and ecosystem of a region called?
- Biocommunity
  - Bioconservation
  - Biodiversity
  - Biosphere

54. What is used to determine past temperatures using trapped bubbles?
- Fossils
  - Growth rings
  - Oxygen-isotope ratio
  - Rock layer

55. Analyze the given diagram of electromagnetic spectrum below.

THE ELECTROMAGNETIC SPECTRUM



Which electromagnetic wave has the **highest** frequency?

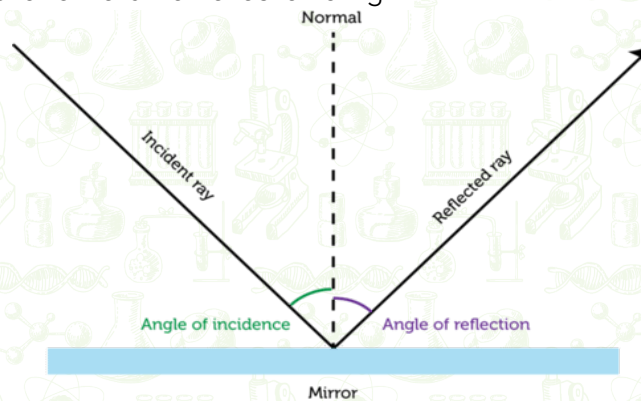
- Gamma rays
  - Infrared
  - Microwave
  - Radio
56. What type of friction is present between the ground and the roller skates?



- Fluid
  - Rolling
  - Sliding
  - Static
57. What is the study of everything in the universe?
- Anthology
  - Astrology
  - Astronomy
  - Cosmology

58. Which part of the cell is not present in plants?
- Cell wall
  - Chloroplast
  - Lysosome
  - Mitochondrion

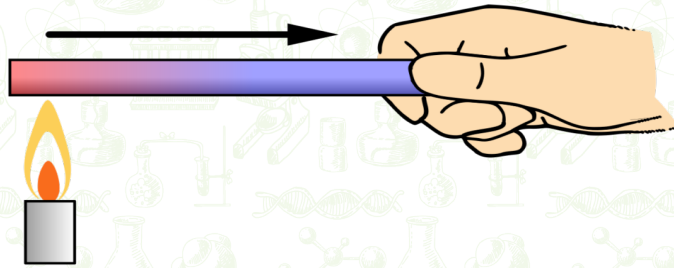
59. The diagram below shows the law of reflection of light.



- Which statement affirms this law?
- An angle at which the reflected rays leave the surface is equal to the angle at which the incident rays strike the surface.
  - An angle at which the reflected rays leave the surface is greater than the angle at which the incident rays strike the surface.
  - An angle at which the reflected rays leave the surface is less than the angle at which the incident rays strike the surface.
  - Both the angle of reflected and incident rays are not measurable when light hits a plane mirror.
60. Which substances can speed up a chemical reaction?
- Catalysts
  - Inhibitors
  - Products
  - Reactants
61. In which layer of the atmosphere do meteors burn up?
- Exosphere
  - Mesosphere
  - Stratosphere
  - Troposphere
62. Which are the building blocks of proteins?
- Amino acids
  - Fatty acids
  - Nucleic acids
  - Ribonucleic acids



63. How is heat transferred in the image below?



- A. Conduction
- B. Convection
- C. Radiation
- D. Reduction

64. What could be the kinetic energy of a 0.8-kg encyclopedia sitting on top of the table?

- A. 0 J
- B. 0.4 J
- C. 0.8 J
- D. 1.6 J

65. Which law of motion explains why a rolling ball will keep on rolling unless an outside force like friction stops its motion?

- A. Law of Inertia
- B. Law of Interaction
- C. Law of Acceleration
- D. Law of Deceleration

66. In which stage of meiosis do synapsis and crossing-over take place?

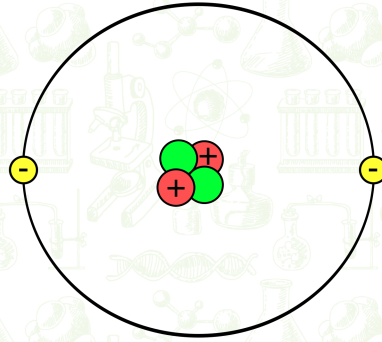
- A. Prophase I
- B. Prophase II
- C. Anaphase I
- D. Metaphase II

67. Which behavior of light explains why the pencil appears to be bent in the image below?



- A. Diffraction
- B. Reflection
- C. Refraction
- D. Transmission

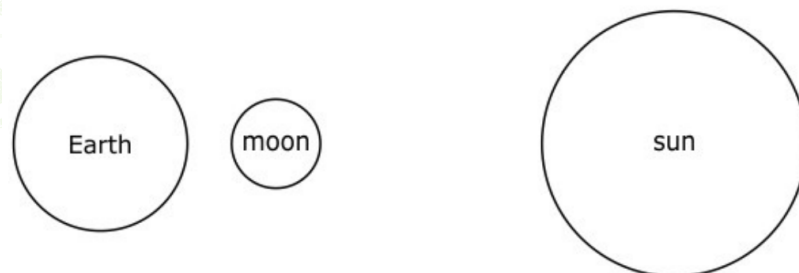
68. Below is the atomic model of the element Helium.



How many protons does Helium have?

- A. 1
  - B. 2
  - C. 4
  - D. 6
69. On which continent have the most dinosaur fossils been found?
- A. Africa
  - B. Asia
  - C. Australia
  - D. North America
70. Which characterizes the teeth of a meat-eating dinosaur?
- A. Even
  - B. Flat
  - C. Jagged
  - D. Round
71. When is a species considered extinct?
- A. When it has low population.
  - B. When it has high population.
  - C. When it is no longer existing.
  - D. When its existence is threatened.
72. What is the effect caused by the tilt of Earth's axis?
- A. The changing season
  - B. Meteors and asteroids
  - C. The alignment of the planets
  - D. Periods of daylight and darkness
73. Which statement best describes the arrangement of the moon, the sun, and Earth during spring tides?
- A. The sun reverses its orbit around Earth in reference to the moon.
  - B. The moon reverses its orbit around Earth in reference to the sun.
  - C. The sun and moon are at right angles to each other in reference to Earth.
  - D. The sun and moon are in a straight line with each other in reference to Earth.
74. Which choice best explains the different phases of the moon?
- A. The changing distance of the moon from Earth.
  - B. The changing motion of the moon as it orbits Earth.
  - C. The change in the amount of light reflected from the sun as the moon orbits Earth.
  - D. The change in the amount of light reflected from Earth as the moon orbits the sun.

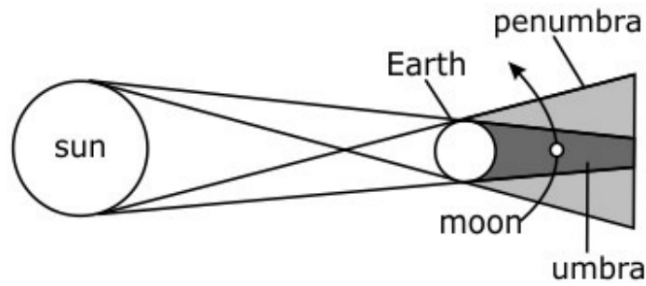
75. In the Hertzsprung-Russell diagram, where are most of the stars located?
- In the upper left corner
  - In the upper right corner
  - In a long stretch from the upper left to the bottom right
  - In a long stretch from the upper right to the bottom left
76. Which two characteristics of stars are plotted on the Hertzsprung-Russell diagram?
- Luminosity
  - Mass
  - Size
  - Temperature
- 1 and 2 only
  - 1 and 4 only
  - 2 and 3 only
  - 3 and 4 only
77. What are the icy rocks that travel from either the Kuiper Belt or from the Oort Cloud?
- Asteroids
  - Comets
  - Meteors
  - Meteoroids
78. How does the ion tail of a coma form?
- The ice portions of the comet melt as it enters Earth.
  - The ice portions of the comet freeze as it enters Earth.
  - The ice portions of the comet melt as it moves nearer to the sun.
  - The ice portions of the comet freeze as it moves nearer to the sun.
79. An arrangement is shown below.



What effect does this arrangement have on the tidal range?

- The tide is larger than normal because the gravitational forces of the sun and moon pull in the same direction.
- The tide is larger than normal because the gravitational forces of the sun and moon pull in opposite directions.
- The tide is smaller than normal because the gravitational forces of the sun and moon pull in the same direction.
- The tide is smaller than normal because the gravitational forces of the sun and moon pull in opposite directions

80. This diagram shows an alignment of the sun, Earth, and the moon.



Which event happens during this alignment?

81. This table shows the average surface temperatures of four planets.

Planet	Average Low Temperature / High Temperature
1	-50 °F / 20 °F
2	38 °F / 100 °F
3	117 °F / 195 °F
4	130 °F / 320 °F

Which planet would most likely be able to support life similar to that found on Earth?

82. Where is food made in a plant cell?
- A. In the nucleus
  - B. In the chloroplast
  - C. In the cell membrane
  - D. In the endoplasmic reticulum

83. Which organelle controls what substances enter or leave a plant or animal cell?
- A. Nucleus
  - B. Cell wall
  - C. Chloroplast
  - D. Cell membrane

84. Which type of offspring is most likely the result of asexual reproduction?
- A. Offspring that inherit only beneficial genes
  - B. Offspring that inherit genes from both parents
  - C. Offspring that are genetically identical to each other
  - D. Offspring that are genetically different from each other

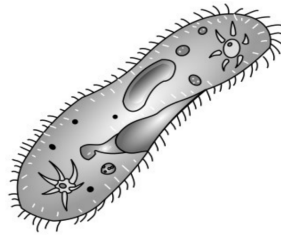
85. The Punnett square below shows the predicted genotypes of a cross between two parent organisms.

		father	
		?	?
mother	?	AA	AA
	?	Aa	Aa

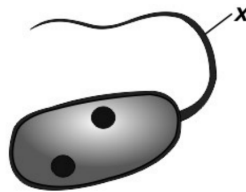
Which choice lists possible genotypes of the parents?

- A. Father: Aa; Mother: Aa
- B. Father: AA; Mother: Aa
- C. Father: AA; Mother: aa
- D. Father: aa; Mother: AA

86. Which is considered to be the 'powerhouse' of cells?
- Lysosome
  - Mitochondria
  - Nucleus
  - Vacuole
87. Which process has evolved to yield the greatest variation in offspring?
- Budding
  - Meiosis
  - Mitosis
  - Replication
88. Which pathogen, by being the smallest, is able to spread and infect the greatest number of hosts?
- Bacteria
  - Fungi
  - Protists
  - Viruses
89. Ricky observed this organism under the microscope.

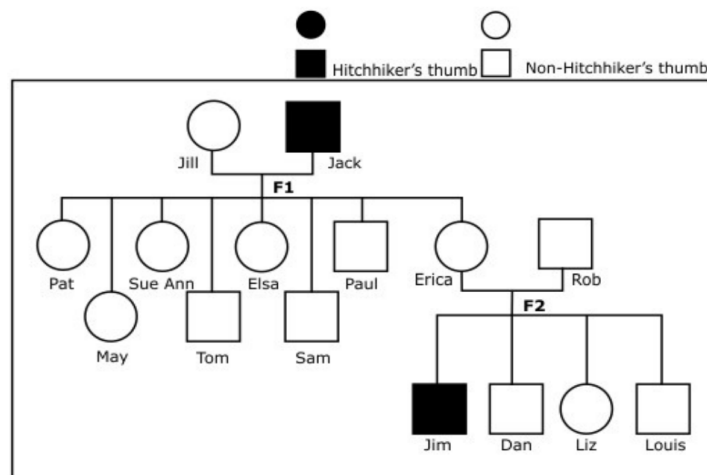


- Which organism did he observe?
- A volvox because it has cilia.
  - A euglena because it has cilia.
  - An amoeba because it has cilia.
  - A paramecium because it has cilia.
90. This diagram shows a unicellular protist.



Which structure is identified as X?

91. The pedigree below shows the inheritance pattern of hitchhiker's thumb in a multigenerational family.



How many people in this family have a hitchhiker's thumb?

92. Which is the best example of a pure substance?
- Peanuts
  - Milk
  - Gold
  - Air
93. Which is the best description of a solution?
- Element
  - Compound
  - Homogeneous mixture
  - Heterogeneous mixture
94. Which best describes a compound?
- The simplest form of matter
  - An element that has changed state
  - A physical mixture of chemicals and elements
  - A chemical combination of two or more elements

95. Chemical formulas for several common substances are listed in the table below.

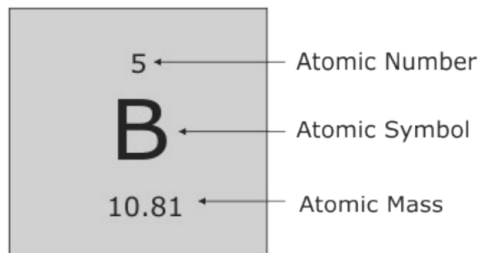
Substance	Chemical Formula
Water	H <sub>2</sub> O
Ammonia	NH <sub>3</sub>
Sugar	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>
Baking soda	NaHCO <sub>3</sub>

Why does hydrogen (H) have a different subscript in each substance?

- The subscript indicates the number of hydrogen atoms in each substance.
  - The subscript indicates the number of mixtures that the hydrogen is forming.
  - The subscript indicates the number of compounds that the hydrogen is forming.
  - The subscript indicates whether the hydrogen is forming a compound or a mixture
96. Which statement best explains how the periodic table is organized?
- Increasing atomic number from left to right
  - Increasing number of neutrons from left to right
  - Decreasing number of electrons from left to right
  - Decreasing atomic mass number from left to right

97. How are elements similar to those in the same group on the periodic table?
- They have the same number of valence electrons.
  - They have the same number of electrons.
  - They have the same number of protons.
  - They have the same atomic mass.
98. An element, X, contains 14 protons, 15 neutrons, and 14 electrons. Which is most likely the same element as X?
- Element A: 13 protons, 15 neutrons, 14 electrons
  - Element B: 14 protons, 14 neutrons, 14 electrons
  - Element C: 15 protons, 14 neutrons, 15 electrons
  - Element D: 13 protons, 13 neutrons, 13 electrons
99. Which group on the periodic table has the greatest number of metallic elements?

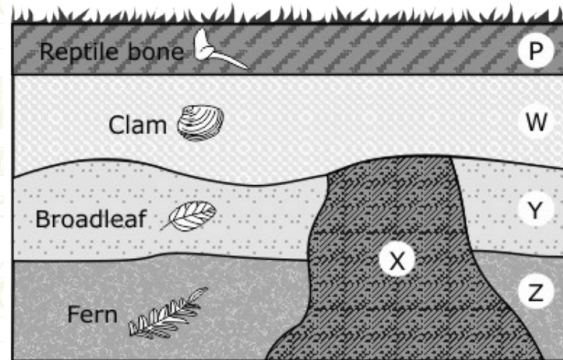
100. The figure below shows how information about a specific element is represented on the periodic table.



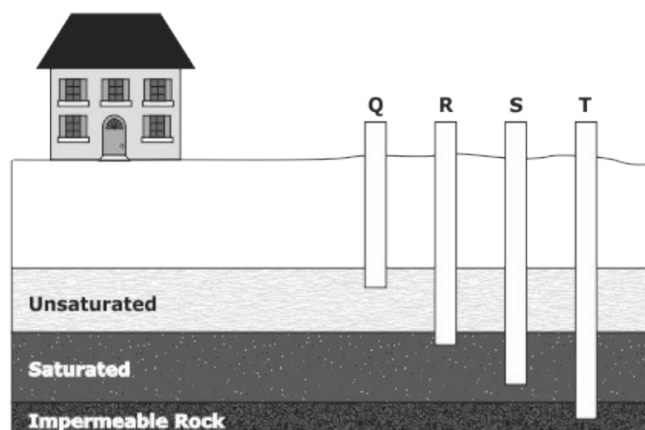
If the given atom is neutral, how many electrons does it have?

101. Which best describes the amount of Earth's total water supply that is usable freshwater?
- Less than 1%
  - Less than 25%
  - Greater than 50%
  - Greater than 75%
102. Why is water from an aquifer more likely to be cleaner than water from other sources?
- Because it rises to the surface near the ocean.
  - Because it forms where fresh and saltwater meet.
  - Because it receives water directly from precipitation.
  - Because pollutants are filtered by rock and soil deep within Earth.
103. Which are the most abundant dissolved gases in ocean water?
- Nitrogen and carbon dioxide
  - Oxygen and carbon dioxide
  - Oxygen and methane
  - Nitrogen and sulfide
104. In which part of the ocean do the greatest number of organisms live?
- In the deep zone to escape predators
  - Near the shore to burrow in the sand
  - Close to the surface to be near the largest food source
  - In the open ocean to regulate their bodies in cooler temperatures

105. Which is the most exact method of determining the age of geologic features?
- Relative dating
  - Radioactive dating
  - Analyzing ice core samples
  - Comparing fossils to living organisms
106. Which undisturbed rock layers are most likely to contain fossils resembling existing species?
- Layers on top
  - Layers on bottom
  - Layers near to oceans
  - Layers near to volcanoes
107. Which is used to find the relative age of a rock?
- Composition of rock layers
  - Position of rock layers
  - Carbon-14 dating
  - Uranium dating
108. The diagram below shows fossils and rock features.



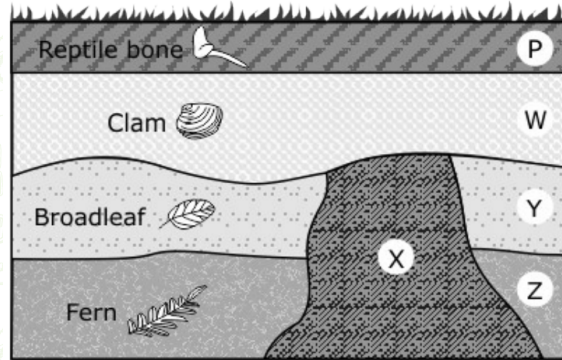
- How does intrusion X compare to the ages of the other rock layers and fossils in this geologic column?
- Intrusion X is older than layers Y and Z.
  - Intrusion X is younger than all the layers.
  - Intrusion X is older than the clam and broadleaf fossils.
  - Intrusion X is younger than the broadleaf and fern fossils.
109. A family living in a house needs to dig a new well before they will have usable water. Several options for the well location are shown in the diagram below.



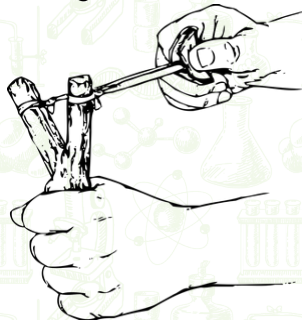
Which location would be the best choice for the new well?



110. The diagram below shows fossils and rock features.



111. The picture below shows an extended slingshot.

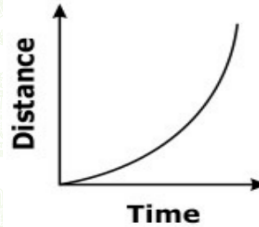


What type of energy is demonstrated by the hand holding the slingshot back in place?

- A. Power
  - B. Kinetic energy
  - C. Elastic potential energy
  - D. Gravitational potential energy
112. If a boulder sits on top of a hill, which best describes the type of energy it is exhibiting?
- A. Electrical
  - B. Kinetic
  - C. Mechanical
  - D. Potential
113. Which factor would most likely change the potential energy of an object?
- A. Height
  - B. Temperature
  - C. Texture
  - D. Volume
114. How is work done on an object?
- A. The object is pushed and remains stationary.
  - B. The object is not pushed and remains stationary.
  - C. The object is pushed and moves a certain distance.
  - D. The object is not pushed and moves a certain distance.
115. In a closed circuit made of a battery, a wire, a light bulb, and a switch, which component is most likely responsible for opening and closing the circuit?
- A. Battery
  - B. Light bulb
  - C. Switch
  - D. Wire

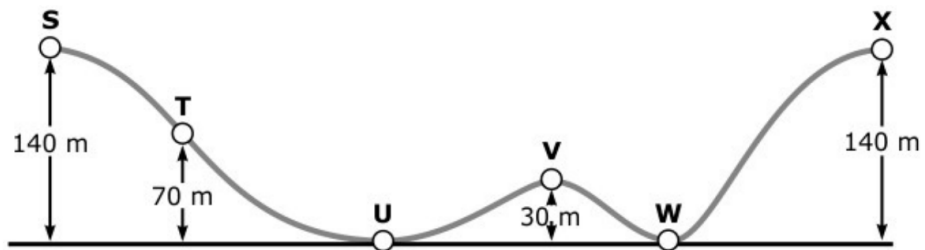
116. An object moves in a straight line a distance of 5 meters in 10 seconds. What action could result in an increase in the speed of the object?
- A. Increasing the amount of time it takes the object to move 5 meters
  - B. Decreasing the amount of time it takes the object to move 5 meters
  - C. Making the object move 5 meters in 10 seconds but in the opposite direction
  - D. Making the object move 5 meters in 10 seconds but in a perpendicular direction

117. What does the graph below about the speed of a moving object indicate?



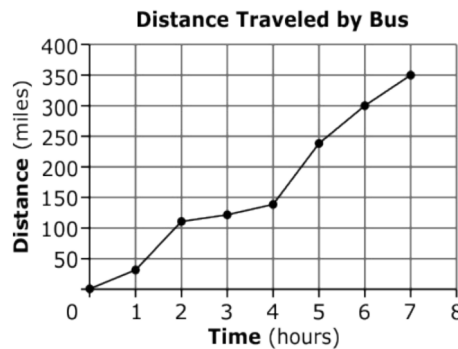
- A. It is increasing.
  - B. It is decreasing.
  - C. It remains the same.
  - D. It increases then decreases.
118. How does using a pulley to lift an object increase mechanical advantage?
- A. By decreasing the mass of the object being lifted
  - B. By increasing the mass of the object being lifted
  - C. By increasing the amount of force needed to lift the object
  - D. By decreasing the amount of force needed to lift the object

119. The diagram below shows the path of an object.



The object is placed on point S and released toward point X. At which point will the object have the same amount of potential energy as it does when it is at point S?

120. The graph below shows the distance a bus traveled over seven hours.



When is the bus traveling the fastest?

**Natural Science Discipline**  
**Category 3 - Sample Questions**  
**ANSWER KEY**

No	Answer	No	Answer	No	Answer	No	Answer
1	C	31	When the rabbit population increases the fox population increases and when the rabbit population decreases the fox population decreases. As the population of rabbits increased the foxes also increased as they have more rabbits to eat	61	B	91	Two
2	D	32	From the top: Exosphere, Thermosphere, Mesosphere, Stratosphere, Troposphere	62	A	92	C
3	B	33	B	63	A	93	C
4	A	34	D	64	A	94	D
5	A	35	D	65	A	95	A
6	B	36	D	66	A	96	A
7	It controls activities.	37	D	67	C	97	A
8	There is less light in Diagram 1 compared to Diagram 2. In Diagram 1, the pupil has gotten larger to let in more light.	38	B	68	B	98	B
9	C	39	Irregular galaxy	69	D	99	Group 2 / Group IIA / Alkaline Earth Metals /

						Beryllium family
10	D	40	The ice portions of the comet melt as it moves nearer to the sun.	70	C	100 5
11	C	41	D	71	C	101 A
12	C	42	D	72	A	102 D
13	B	43	B	73	D	103 A
14	B	44	D	74	C	104 C
15	When the two substances were mixed, a gas (carbon dioxide) is produced and it goes up into the balloon causing it to inflate	45	Neurons do not touch each other, but where the neuron does come close to another neuron, a synapse is formed between the two. A synapse is the small gap between two neurons, where nerve impulses are relayed by a neurotransmitter from the axon of a presynaptic (sending) neuron to the dendrite of a postsynaptic (receiving) neuron.	75	C	105 B
16	Helium (He)	46	Trace fossil	76	B	106 A
17	D	47	D	77	B	107 B
18	C	48	A	78	C	108 D
19	C	49	D	79	A	109 S/ Saturated Layer
20	D	50	C	80	Lunar Eclipse	110 Reptile Bone
21	B	51	B	81	Planet B	111 C
22	D	52	D	82	B	112 D
23	Conduction	53	C	83	D	113 A
24	To allow for the metal tracks to expand on hot days. If no gap is left, the expansion	54	C	84	C	114 C

	in summer will cause the rails to bend sideways which will result in train accidents						
25	B	55	A	85	B	115	C
26	B	56	B	86	B	116	B
27	C	57	D	87	B	117	A
28	C	58	C	88	D	118	D
29	A	59	A	89	D	119	Point X
30	D	60	A	90	Flagellum	120	Between hours 4 and 5