

**VIRGINIA
STANDARDS OF LEARNING ASSESSMENTS**

Spring 2001 Released Test

**GRADE 8
SCIENCE**

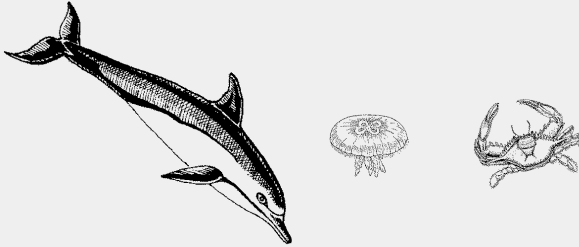
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DIRECTIONS

Read each question carefully and choose the best answer. Then mark the space in the answer booklet for the answer you have chosen.

SAMPLE

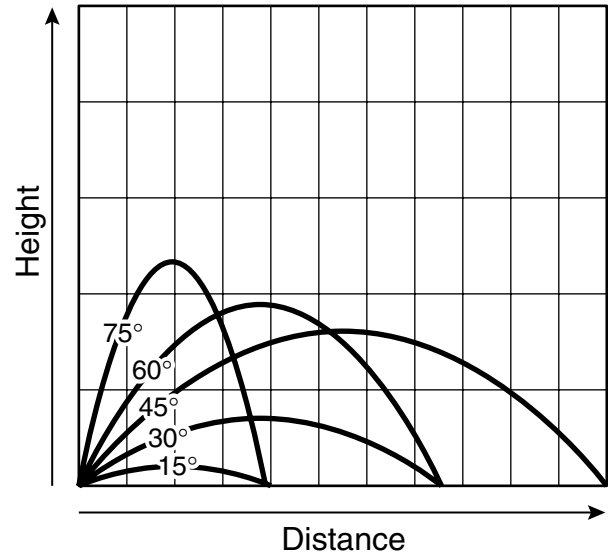


These animals are grouped together because all of them —

- A live in the water
- B are fish
- C are warm-blooded
- D lay eggs

1

**Distances Javelin Travels
When Thrown With Same Force**



According to the graph, which angle of release would cause the javelin to go the farthest?

- A 75°
- B 60°
- C 45°
- D 30°

2 **Which type of characteristics can be inherited?**

- F Those controlled by genes
- G Those caused by accidents
- H Those produced by exercise
- J Those produced by diet

3

Period		Group																				
	1	2											13	14	15	16	17	18				
1	1																		2			
	H																		He			
2	3	4											5	6	7	8	9	10				
	Li	Be											B	C	N	O	F	Ne				
3	11	12	3											13	14	15	16	17	18			
	Na	Mg												Al	Si	P	S	Cl	Ar			
4	19	20	21											29	30	31	32	33	34	35	36	
	K	Ca	Sc											Cu	Zn	Ga	Ge	As	Se	Br	Kr	
5	37	38	39	4											47	48	49	50	51	52	53	54
	Rb	Sr	Y	Z											Ag	Cd	In	Sn	Sb	Te	I	Xe
6	55	56	*											79	80	81	82	83	84	85	86	
	Cs	Ba												Au	Hg	Tl	Pb	Bi	Po	At	Rn	
7	87	88	†											halogens					noble gases			
	Fr	Ra																				
	alkali metals																					
	alkaline earth metals																					

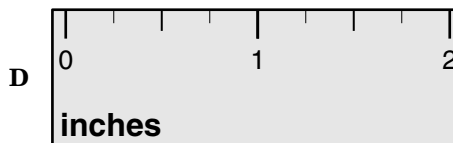
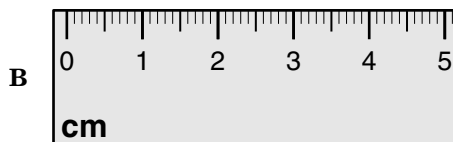
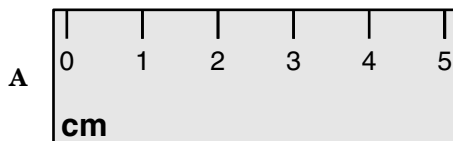
Which element is an alkali metal?

- A K
- B Mg
- C Al
- D Ag

4 Which of these can be separated by using a magnet?

- F A mixture of sand and salt
- G Rust formed from iron and oxygen
- H A compound of hydrogen and sulfur
- J A mixture of sand and bits of iron

5 An experiment was set up to measure the distance a snail would travel in 5 minutes. Which of these rulers should be used to give the most precise measurement?

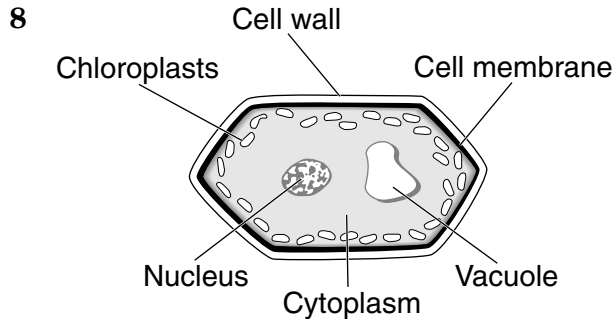


6 The ermine is a small animal that lives along riverbanks and in forests. During the spring and summer, it grows a brown coat. It sheds the brown coat during the autumn and grows a white one. This change of color in the ermine's coat allows it to —

- F hide from predators
- G attract a mate
- H locate a water supply
- J find food more easily

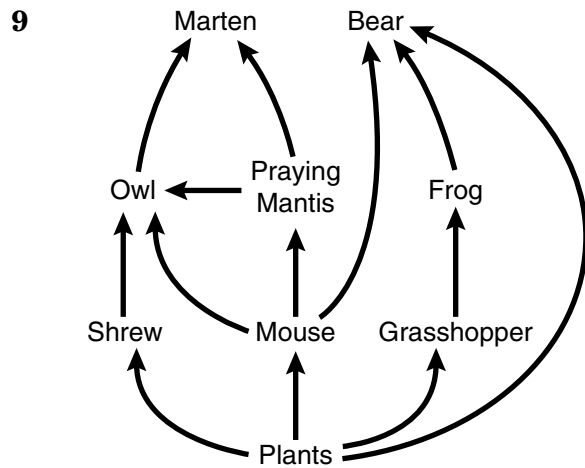
7 Solar cells are used to turn sunlight into —

- A inertia
- B force
- C magnetism
- D electricity



In this plant cell, which cellular structure is responsible for storing food, water, and wastes?

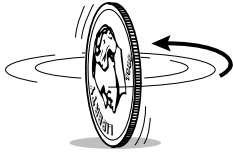
- F Cytoplasm
- G Vacuole
- H Nucleus
- J Cell membrane



Which of these populations is most likely to increase if the number of grasshoppers decreases?

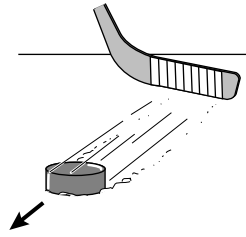
- A Plant
- B Frog
- C Praying mantis
- D Owl

- 10 The Earth makes a complete rotation once every 24 hours. Which of these would best illustrate rotation?



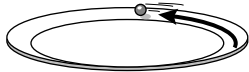
Coin Spinning

F



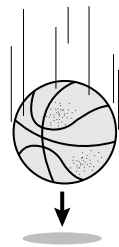
Puck Sliding on Ice

H



Marble Going Around the Edge of a Plate

G



Ball Falling

J

- 11 When animals hibernate, their heart rate and respiration decrease and they lose consciousness. Why do some animals hibernate?

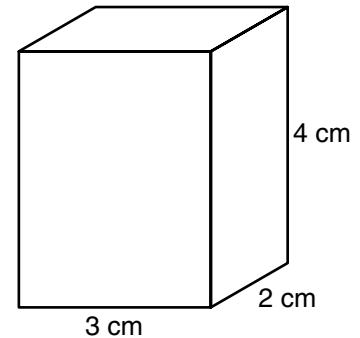
- A To increase their body fat during cold periods
- B To conserve energy usage during the winter
- C To give their fur time to grow longer and thicker
- D To rest after a summer of high activity

- 12 A wheelbarrow full of concrete mix that needs to be moved onto a platform could be moved either by lifting it above the ground and setting it onto the platform or by using an inclined plane. The advantage of using the inclined plane is that the work can be done —

- F more quickly
- G with less friction
- H using less force
- J using more energy

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

Mass = 12 g



The density of this box is —

- A 0.5 g/cm^3
- B 1.0 g/cm^3
- C 1.5 g/cm^3
- D 2.0 g/cm^3

14 Which of the following organisms break down dead material and return the substances to the environment?

- F Grasshopper and worm
- G Grass and algae
- H Bacteria and fungi
- J Snake and grasshopper

15 Which property is required of a liquid in order for it to be a good fuel?

- A Its acidity
- B Its combustibility
- C Its density
- D Its boiling point

16

5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007
13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorous 30.974

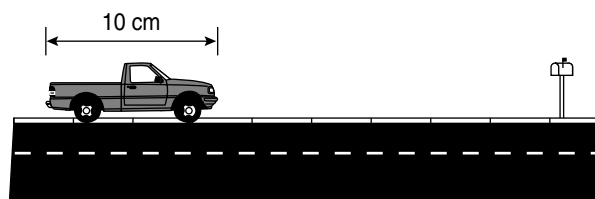
KEY

17	Atomic Number
Cl	Symbol
Chlorine	Name
35.453	Average Atomic Mass

Which of these elements has the greatest average atomic mass?

- F B
- G C
- H N
- J Al

17



In the scale model above, one centimeter is equal to one-half of a meter. The mailbox is 2 truck lengths away from the model truck. How far away is the mailbox from the truck on the real street?

- A 5 meters
- B 10 meters
- C 15 meters
- D 20 meters

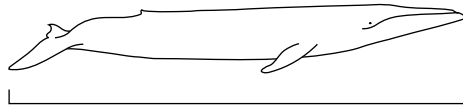
18 Wherever civilizations have flourished, forests have been destroyed. Hundreds of years ago in England, rivers and seaports began to fill with silt after the forests were destroyed. What caused the silt to fill the seaports?

- F Eutrophication
- G Succession
- H Erosion
- J Irrigation

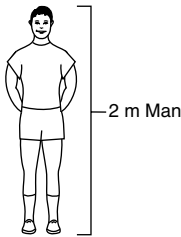
19 Which of the following does *not* use metric units to measure the density of a solution?

- A 10.5 grams/milliliter
- B 1.56 pounds/fluid ounce
- C 1050 kilograms/cubic meter
- D 1.05 grams/cubic centimeter

20



Baby Blue Whale



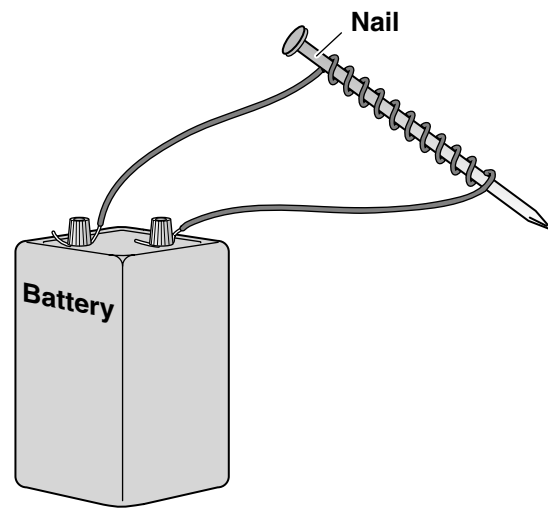
According to the scale shown above, what is the approximate length of the baby blue whale?

- F 2 meters
- G 4 meters
- H 6 meters
- J 10 meters

21 Gases are much more compressible than liquids. According to the particle model of matter, gases are more easily compressed into smaller volumes because the particles in gases are —

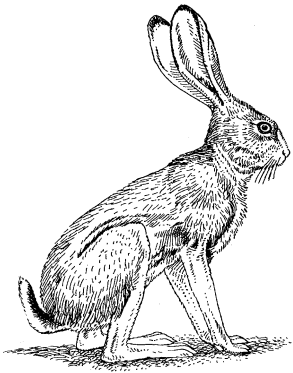
- A smaller
- B more active
- C farther apart
- D filled with air

22



The picture shows how to make an electromagnet. Which of these would make the electromagnet strongest?

- F Using a longer wire from the battery to the nail
- G Wrapping the wire around the nail more times
- H Wrapping the wire around a nonmetallic object
- J Making the loops of wire less tightly coiled



Which of these best enables this animal to rid its body of excess heat in a hot desert environment?

- A Its large ears
- B Its flexible feet
- C Its sandy color
- D Its fur

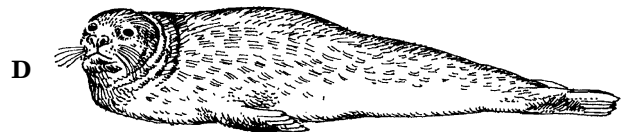
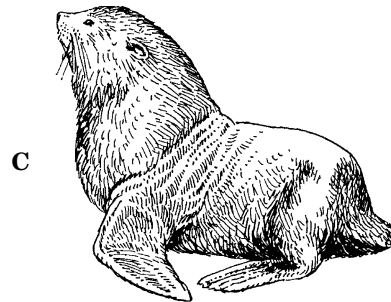
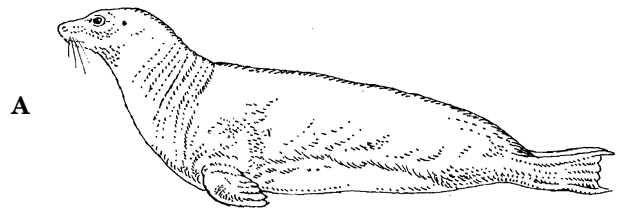
What type of animals live in a wetland?

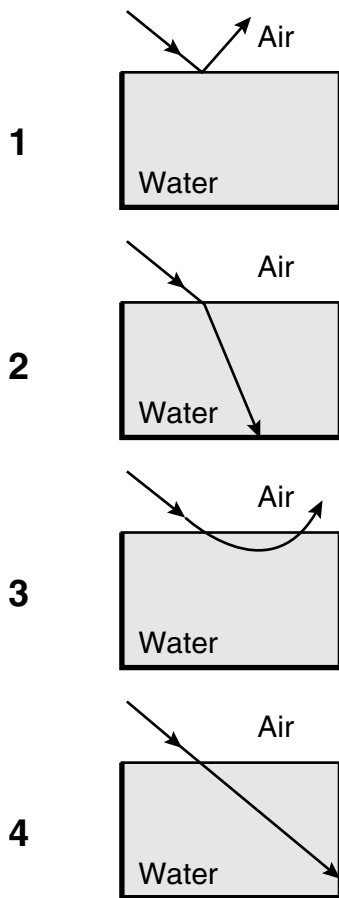
Which type of report would probably provide the most accurate answer to the above question?

- F "Water Quality in Wetlands," published by the United States Geological Survey
- G "Endangered Species in Our Wetlands," by a reporter for the Daily Globe Newspaper
- H "Birds of Wetlands" in *Science*, the journal for the American Association for the Advancement of Science
- J "Organisms in Wetlands," a report on the internet by the Chesapeake Bay Foundation

Sea Lions	True Seals
external ears	no external ears
hind flippers can turn forward	hind flippers do not turn forward
swim with front flippers	swim with hind flippers
soles of flippers bare	flippers fully furred

According to this chart, which of these animals is a sea lion?





Which diagram shows the refraction of light as it enters water from the air?

- F 1
G 2
H 3
J 4

27 Asexual reproduction involves only one parent. The offspring of this type of reproduction have —

- A DNA identical to the DNA of the parent
B DNA that is different from the parent
C one-half of the DNA of the parent
D DNA that is incomplete

	Organism	Environment	Raw Materials	Products
A	bacteria	darkness	light energy, soil	sugar
B	plant	darkness	oxygen, glucose	carbon dioxide, water
C	plant	light	carbon dioxide, water	sugar, oxygen
D	plant	light	amino acids, oxygen	proteins

According to the chart, which set of conditions represents the process of photosynthesis?

- F A
G B
H C
J D

29 Compounds are made up of more than one element. Which of the following represents a compound?

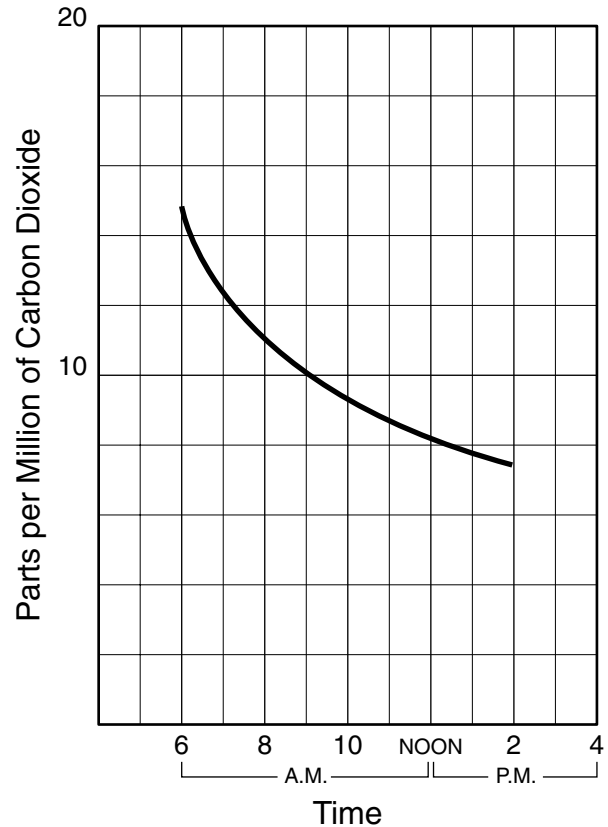
- A H_2
B NH_3
C O_3
D N_2

30 Changes in DNA are known as mutations and can sometimes produce beneficial changes in populations. A mutant form of the normally light-colored peppered moth is dark colored. The dark-colored moth blends in with soot-covered trees in heavily polluted areas. Why would the dark-colored mutation be beneficial in a polluted area?

- F Dark-colored moths have a longer life span than light-colored moths.
- G Dark-colored moths can't be seen well by predators.
- H Dark-colored moths taste bad to most of their predators.
- J Dark-colored moths produce more young than do light-colored moths.

31

**Carbon Dioxide Levels
in a Pond**



The graph shows the relationship between the time of day and the amount of carbon dioxide in a certain pond. Which of these best describes the relationship?

- A During the morning hours, there is less carbon dioxide released by fish.
- B During the morning hours, there is less carbon dioxide found in the pond.
- C There is more carbon dioxide released by animals later in the day.
- D There is more carbon dioxide used up by algae later in the day.

32 A student wishes to test the hypothesis that adding antifreeze to water lowers the freezing point of the water. What would be the dependent (responding) variable?

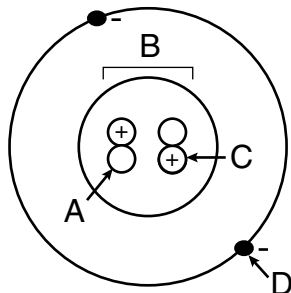
- F Amount of water put into a container
- G Amount of antifreeze added to the water
- H Temperature at which the water/antifreeze mixture freezes
- J Type of thermometer used to measure the freezing point

33 Algae → Frog → Snake → Hawk

The relationship between the algae and the frog may be described as —

- A consumer → producer
- B consumer → decomposer
- C producer → consumer
- D producer → decomposer

34



In this atomic model, point A represents —

- F a proton
- G a nucleus
- H a neutron
- J an electron

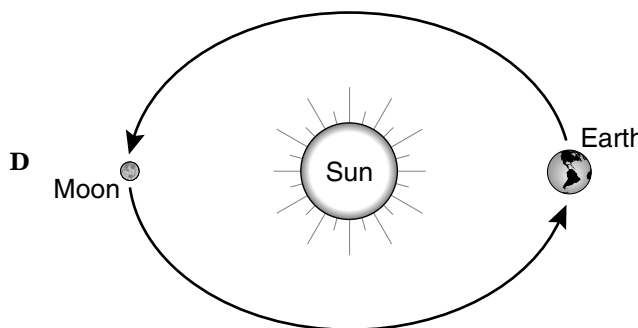
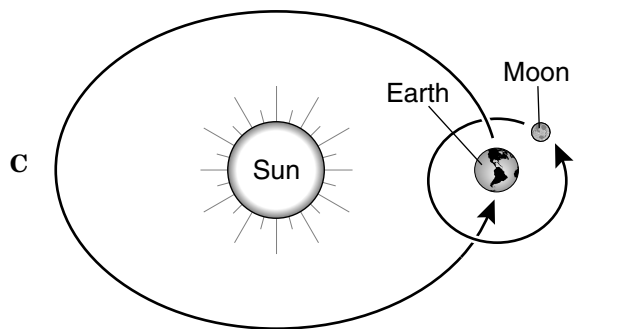
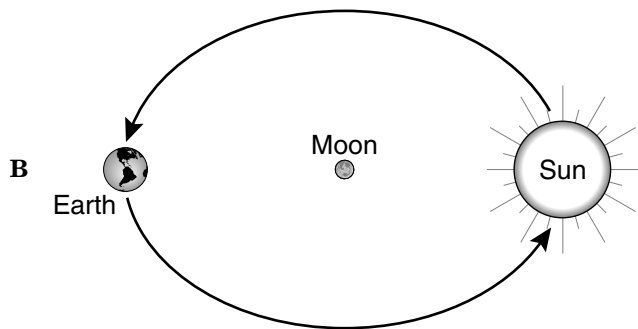
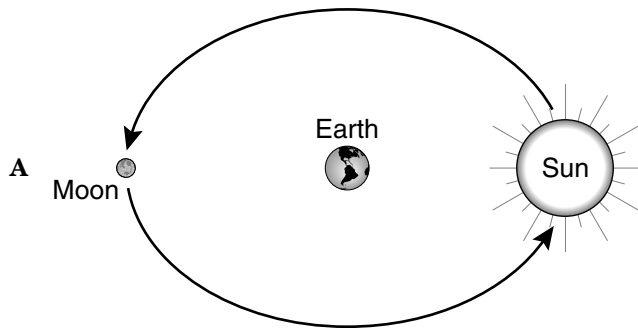
35 A direct electrical current is different from an alternating current because only the direct electrical current —

- A produces a high voltage
- B flows without resistance
- C allows the flow of electrons in one direction
- D can be converted to other forms of energy

36 A battery is placed inside a flashlight and then the flashlight is turned on. The chemical energy of the battery is changed into all of the following forms of energy *except* —

- F electrical energy
- G heat energy
- H light energy
- J mechanical energy

37 Which model best shows the relationship between the Earth, the moon, and the sun?



38 Which of these would be different for an object if measured on the Earth and on the moon?

- F Mass
- G Weight
- H Volume
- J Density

39 Which of the following materials is composed of only one kind of atom?

- A Water
- B Helium
- C Air
- D Sugar

40 A solution may be prepared by dissolving crystals of a salt in water. Which of the following would probably *not* affect the rate of solubility?

- F Reducing the air pressure on the solution
- G Grinding the crystals to make them smaller
- H Stirring the water after adding the crystals
- J Increasing the temperature of the water

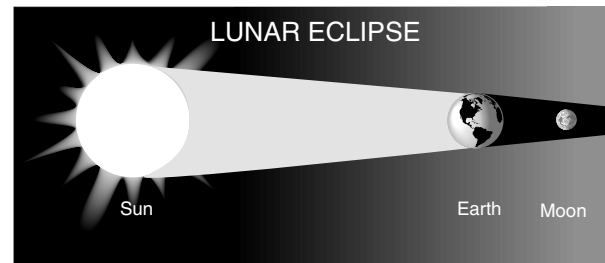
41 Many complex genetic experiments have been performed on plants. One of the very successful ones crossed wild wheat with a fungus-resistant wild grass. This ultimately produced a variety of wheat that was resistant to a very destructive parasitic fungus which kills nonresistant plants. Why would such experimentation benefit humans?

- A The fungus is also dangerous to humans.
- B Wheat is one of the most important food crops worldwide.
- C The fungus could spread to all other plants.
- D Wheat products made from infected plants would taste bad.

42 Which of these *best* shows that calcium is different from all other elements?

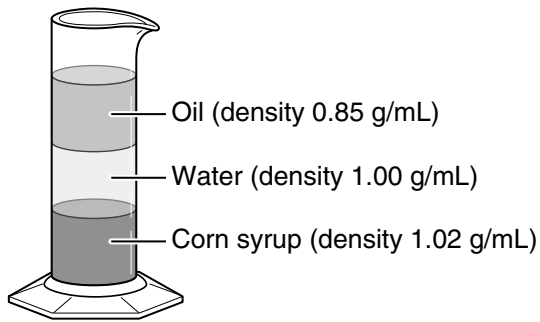
- F Its positive electrical charge
- G Its presence in milk
- H Its number of protons
- J Its ability to combine with oxygen

43



According to this diagram, a lunar eclipse occurs only when the —

- A moon is in the new moon phase
- B moon is between the sun and the Earth
- C sun's rays are directly overhead
- D Earth is between the sun and the moon



Density Column

Densities of Some Unknowns	
Liquids	Density (g/mL)
Sample A	1.02
Sample B	0.96
Sample C	1.15
Sample D	0.82

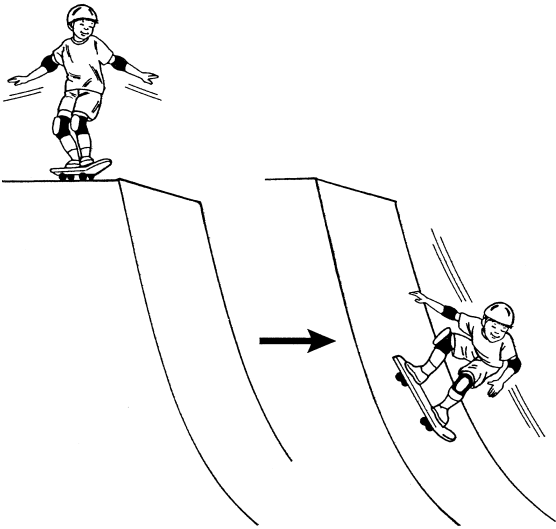
Students measured and recorded the density of 4 samples. Using the density column and the data table shown above, which of the samples will probably float on top of the oil?

- F Sample A
- G Sample B
- H Sample C
- J Sample D

45 Fossils are evidence of living things that were alive many, many years ago and often consist of the skeletons of creatures imbedded in rock. Why don't fossils contain the animal's soft tissues, as well?

- A Because the soft tissues decayed before the fossil could be formed
- B Because the rock breaks down soft tissues
- C Because the soft tissues were always eaten by scavengers
- D Because the rock always smashed the soft tissues flat

49

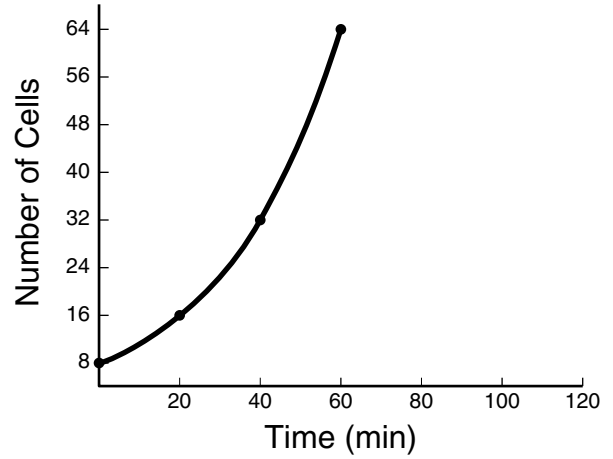


Which type of energy change is occurring in the pictures above?

- A Mechanical energy to chemical energy
- B Potential energy to kinetic energy
- C Chemical energy to heat energy
- D Solar energy to nuclear energy

50

Growth Curve of Bacteria



The picture shows the growth curve of a bacterial population. According to this information, the bacterial population doubles every —

- F 3 minutes
- G 20 minutes
- H 30 minutes
- J 60 minutes



Answer Key

Test Sequence	Correct Answer	Reporting Category	Reporting Category Description
1	C	015	Scientific Investigation
2	F	017	Life Systems
3	A	016	Force, Motion, Energy, and Matter
4	J	016	Force, Motion, Energy, and Matter
5	B	015	Scientific Investigation
6	F	018	Ecosystems
7	D	016	Force, Motion, Energy, and Matter
8	G	017	Life Systems
9	A	018	Ecosystems
10	F	019	Earth and Space Systems
11	B	018	Ecosystems
12	H	016	Force, Motion, Energy, and Matter
13	A	015	Scientific Investigation
14	H	018	Ecosystems
15	B	016	Force, Motion, Energy, and Matter
16	J	016	Force, Motion, Energy, and Matter
17	B	015	Scientific Investigation
18	H	018	Ecosystems
19	B	015	Scientific Investigation
20	G	015	Scientific Investigation
21	C	016	Force, Motion, Energy, and Matter
22	G	016	Force, Motion, Energy, and Matter
23	A	018	Ecosystems
24	J	015	Scientific Investigation
25	C	017	Life Systems
26	G	016	Force, Motion, Energy, and Matter
27	A	017	Life Systems
28	H	017	Life Systems
29	B	016	Force, Motion, Energy, and Matter
30	G	019	Earth and Space Systems
31	D	015	Scientific Investigation
32	H	015	Scientific Investigation
33	C	018	Ecosystems
34	H	016	Force, Motion, Energy, and Matter
35	C	016	Force, Motion, Energy, and Matter
36	J	016	Force, Motion, Energy, and Matter
37	C	019	Earth and Space Systems
38	G	019	Earth and Space Systems
39	B	016	Force, Motion, Energy, and Matter
40	F	016	Force, Motion, Energy, and Matter
41	B	017	Life Systems
42	H	016	Force, Motion, Energy, and Matter
43	D	019	Earth and Space Systems
44	J	016	Force, Motion, Energy, and Matter
45	A	019	Earth and Space Systems
46	H	017	Life Systems
47	C	018	Ecosystems
48	F	015	Scientific Investigation
49	B	016	Force, Motion, Energy, and Matter
50	G	015	Scientific Investigation