

Part I

1 The items listed below were found in a science classroom.

- a heart made of plastic with many of its parts labeled
- clay formed to look like Earth and other planets
- a giant plastic plant cell with removable cell parts

These items are all examples of

- | | |
|-----------------|---------------|
| (1) models | (3) variables |
| (2) experiments | (4) controls |

2 Which of the organisms shown below consists of only one cell?



Pine tree



Ameba



Mushroom



Earthworm

(Not drawn to scale)

- | | |
|---------------|---------------|
| (1) pine tree | (3) mushroom |
| (2) ameba | (4) earthworm |

3 What is the main function of the circulatory system?

- | | |
|---------------------|-------------------------|
| (1) secrete enzymes | (3) produce hormones |
| (2) digest proteins | (4) transport materials |

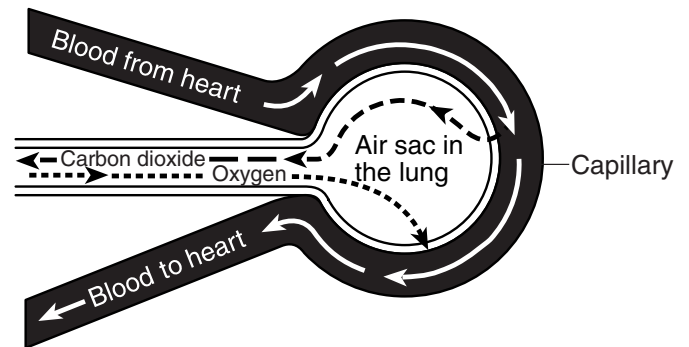
4 Infectious diseases are caused by

- (1) allergies
- (2) vitamin deficiencies
- (3) chemical spills
- (4) microorganisms

5 If a species is no longer able to reproduce, it will

- (1) adapt to its environment
- (2) become immune to disease
- (3) become extinct
- (4) increase its population

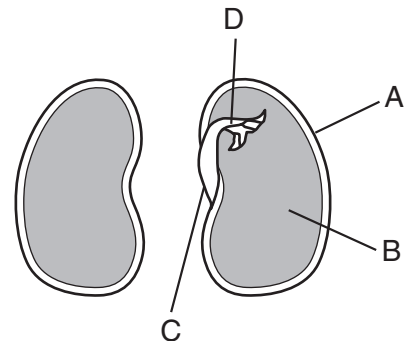
6 The diagram below represents a magnified view of an air sac in the human lung. The white arrows indicate blood flow.



Which two systems are interacting in this diagram?

- (1) skeletal and muscular
- (2) nervous and endocrine
- (3) reproductive and digestive
- (4) respiratory and circulatory

7 The diagram below represents a bean seed that has been cut in half to show its various structures.

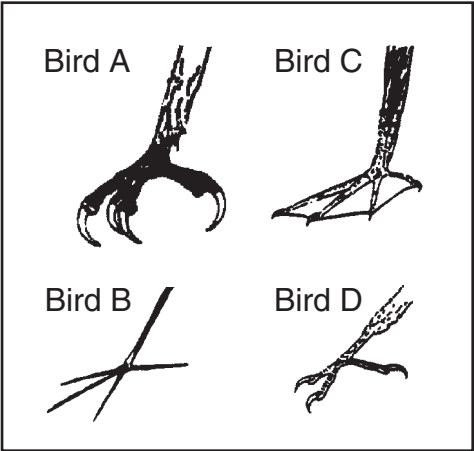


Which letter represents the stored food that the new plant will use for early development?

- | | |
|-------|-------|
| (1) A | (3) C |
| (2) B | (4) D |

Base your answers to questions 8 and 9 on the drawings of bird feet and the dichotomous key below.

A Key to Identifying Birds		
Couplet	Description	
1a	Toes webbed	go to 2
1b	Toes not webbed	go to 3
2a	Four toes webbed together	cormorant
2b	Three toes webbed together	duck
3a	Claws curved	go to 4
3b	Claws not curved	jacana
4a	Claws large	eagle
4b	Claws small	kingfisher



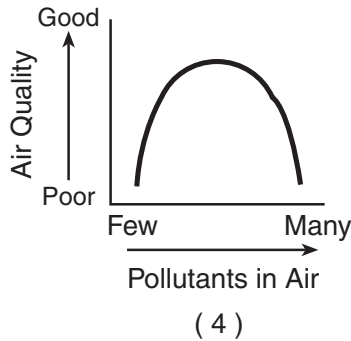
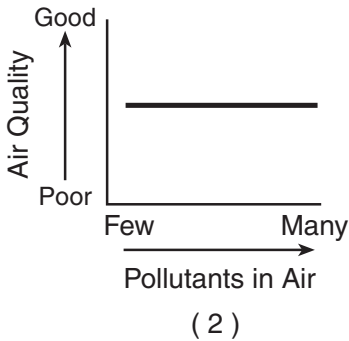
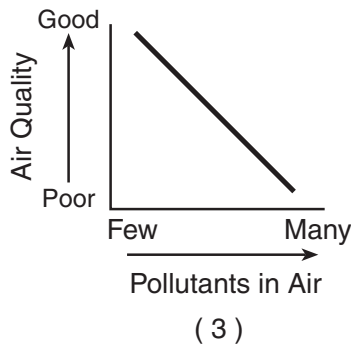
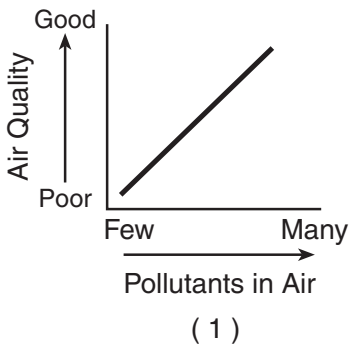
8 Bird *B* is correctly identified as

- (1) a cormorant
- (2) a duck
- (3) an eagle
- (4) a jacana

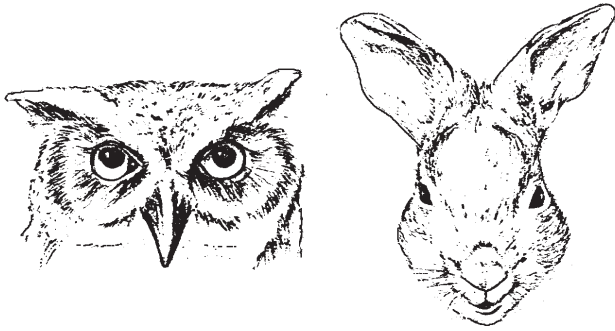
9 What is a common feature of both the eagle and the kingfisher?

- (1) claws large
- (2) claws curved
- (3) three toes webbed together
- (4) four toes webbed together

10 Which graph best represents the relationship between the amount of pollutants in the air and the quality of the air?



- 11 The eyes of the owl and the rabbit shown in the diagram below give each animal a different advantage. The front-facing owl eyes allow the bird to accurately judge distance when swooping in on prey. The side-facing rabbit eyes allow the animal to detect the motion of possible predators.



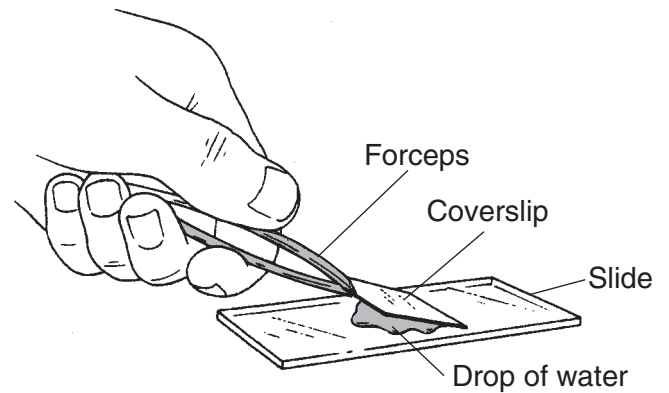
The specialized eye types of these animals are examples of

- (1) disruptions of the natural balance
 - (2) the interdependence of living things
 - (3) adaptations for survival under certain conditions
 - (4) involuntary responses to stimuli
- 12 Which disease is a result of abnormal cell division?
- (1) AIDS
 - (2) cancer
 - (3) chicken pox
 - (4) common cold
- 13 A change in the environment that causes a response is known as a
- (1) stimulus
 - (2) habit
 - (3) reflex
 - (4) source
- 14 The energy obtained from food is measured in units called
- (1) watts
 - (2) Calories
 - (3) degrees
 - (4) pounds

- 15 As the population of small fish in a lake decreases, the population of large fish that depend on the small fish for food will

- (1) reproduce faster
- (2) begin to produce their own food
- (3) decrease in number
- (4) increase in number

- 16 The diagram below shows a student making a wet-mount slide.



Why should the student make sure the edge of the coverslip touches the drop of water before setting the coverslip onto the slide?

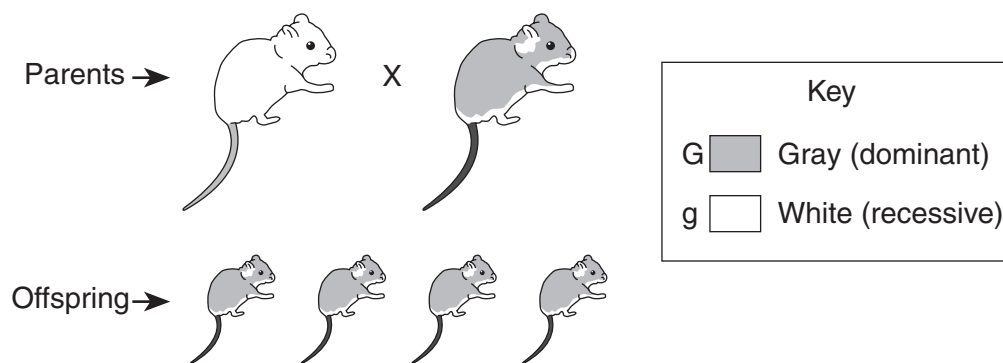
- (1) to increase evaporation
- (2) to reduce air bubbles
- (3) to clean the slide
- (4) to prevent the coverslip from breaking

- 17 Beaver dams can cause floods.

This statement shows how

- (1) animal growth is affected by environmental conditions
- (2) animal behavior may affect the environment
- (3) an animal's health depends on its environment
- (4) an animal's development depends on its environment

Base your answers to questions 18 and 19 on the diagram below. The diagram shows the offspring of a white mouse and a gray mouse. All of the offspring are gray.



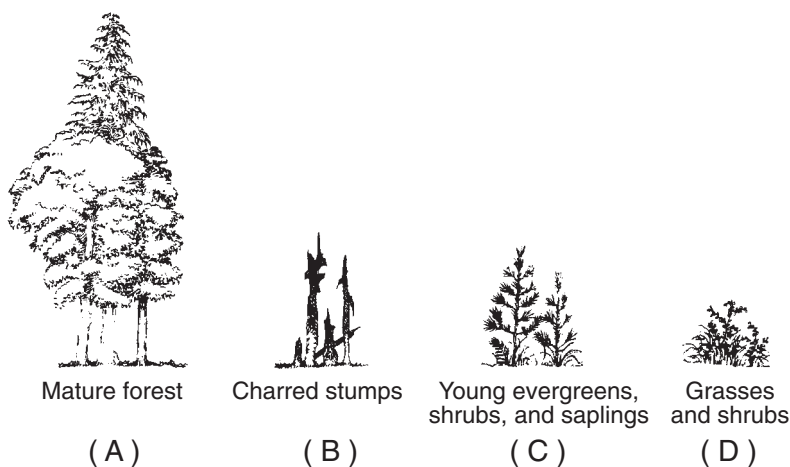
18 Which is a correct gene combination for the parents shown in the diagram?

- | | |
|--------------------|--------------------|
| (1) $GG \times GG$ | (3) $gg \times GG$ |
| (2) $gg \times gg$ | (4) $Gg \times Gg$ |

19 If two gray (Gg) mice mated, what percent of their offspring would have pure white fur?

- | | |
|---------|----------|
| (1) 25% | (3) 75% |
| (2) 50% | (4) 100% |
-

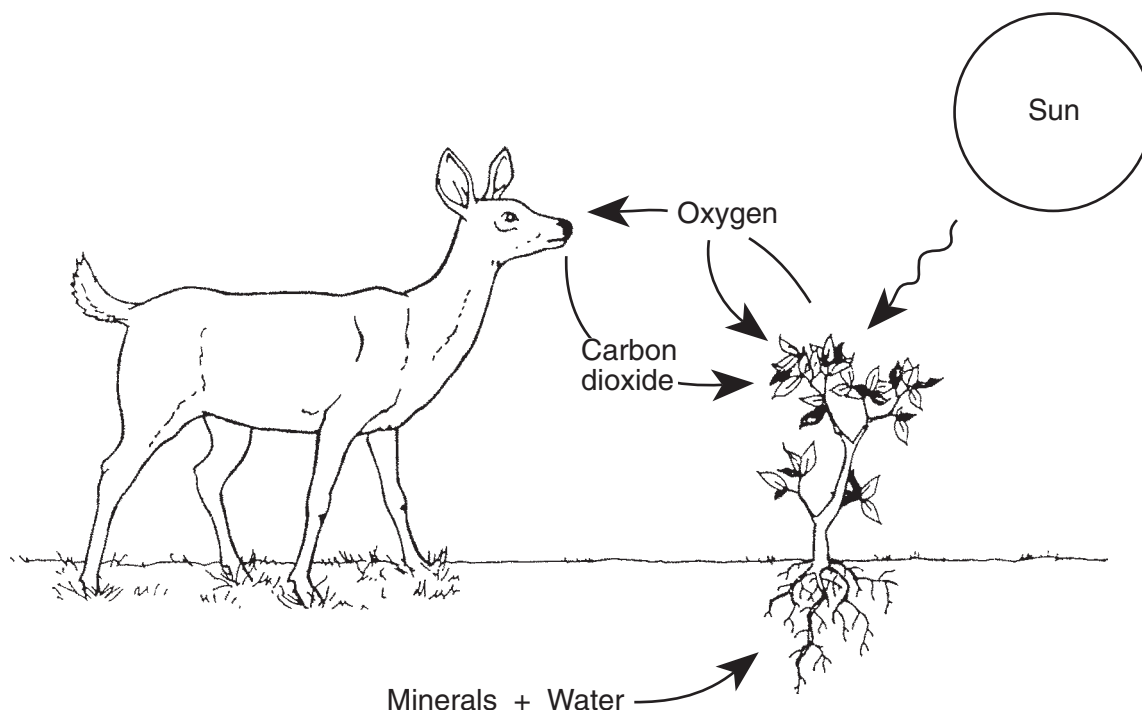
20 The diagrams below show the plant communities present in the same area at different times over a 200-year period following a forest fire.



What is the correct sequence of these plant communities following the forest fire?

- | | |
|---|---|
| (1) $B \rightarrow A \rightarrow D \rightarrow C$ | (3) $B \rightarrow D \rightarrow C \rightarrow A$ |
| (2) $B \rightarrow C \rightarrow D \rightarrow A$ | (4) $B \rightarrow A \rightarrow C \rightarrow D$ |

Base your answers to questions 21 and 22 on the diagram below and on your knowledge of science. The diagram below shows some relationships within a natural community.



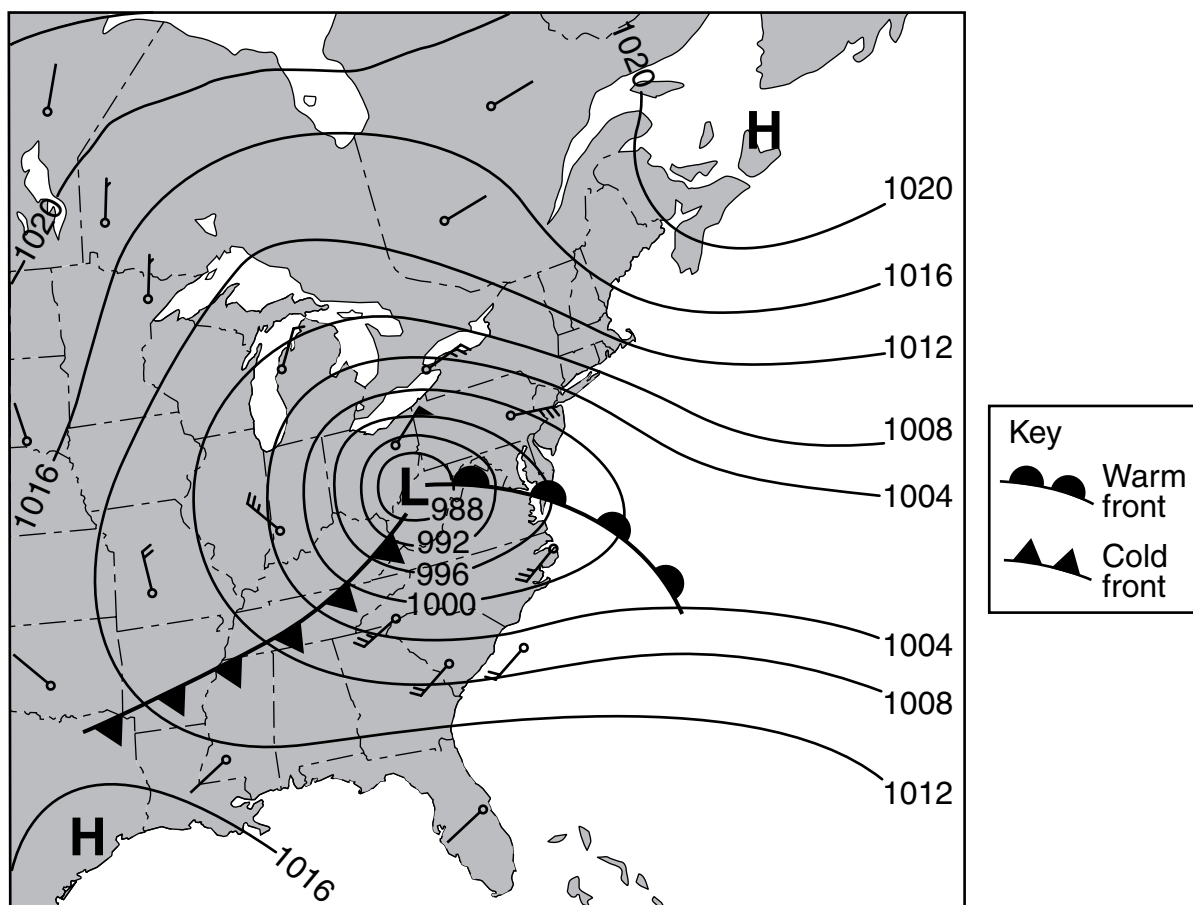
21 Which statement best explains the relationships shown?

- (1) Water changes over time to a nonrenewable resource.
- (2) Living things exchange materials with their environment.
- (3) Minerals recycle the dead materials in the environment.
- (4) Living things produce other living things.

22 Which process produces oxygen that is released into the atmosphere?

- | | |
|-----------------|--------------------|
| (1) respiration | (3) excretion |
| (2) locomotion | (4) photosynthesis |
-

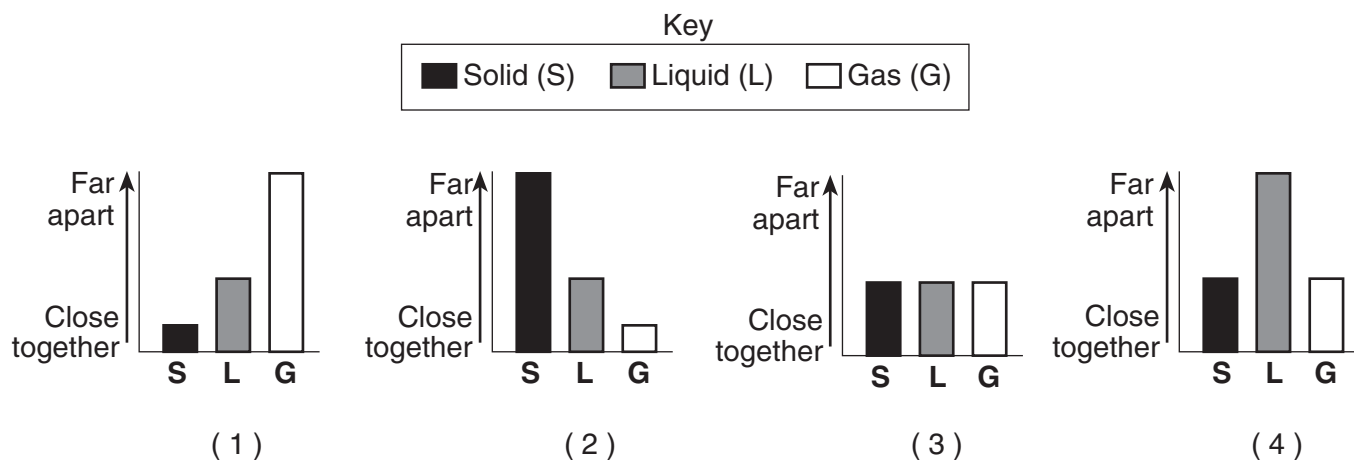
23 The weather map below shows the locations of a warm and a cold front over part of North America.



The numbered lines on the weather map connect locations with the same

- | | |
|--------------------|---------------------|
| (1) wind direction | (3) air temperature |
| (2) wind speed | (4) air pressure |


24 Which graph best represents the relative distance between the particles of most substances in their solid, liquid, and gas states?



25 Which scientific model could be used to predict the properties of an element?

- (1) closed loop system
- (2) Punnett square
- (3) Periodic Table
- (4) water cycle chart

Base your answers to questions 26 through 28 on the chart below, which shows various data collected and predicted for Albany, New York, on March 9, 2001.

Updated: 05:51 AM EST on March 09, 2001	
Observed at	Albany, New York
Temperature	34°F
Windchill	26°F
Humidity	81%
Dewpoint	28°F
Wind	SE at 7 mph
Pressure	29.88 in
Conditions	Overcast
Visibility	10 miles
Clouds	Overcast (OVC): 1800 ft
Sunrise	6:17 AM (EST)
Sunset	5:51 PM (EST)
Moon Rise	6:02 PM (EST)
Moon Set	6:37 AM (EST)
Moon Phase	
	Mar. 09 Mar. 16 Mar. 25

Source: www.accuweather.com

26 The chart shows information about Moon phases, times of sunrise and sunset, and

- (1) climate patterns
- (2) local weather conditions
- (3) seasonal changes
- (4) global warming

27 Which diagram correctly shows the position of the Moon with respect to Earth on March 9, 2001?



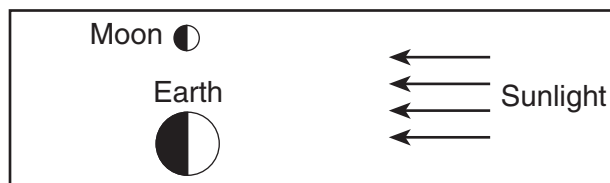
(1)



(2)



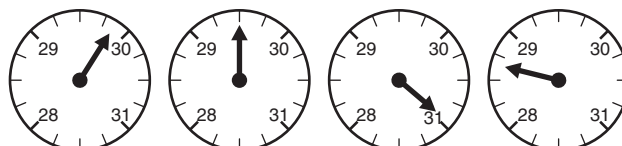
(3)



(4)

(Not drawn to scale)

28 Which instrument dial shows a correct air-pressure reading for Albany, New York, for this date and time?



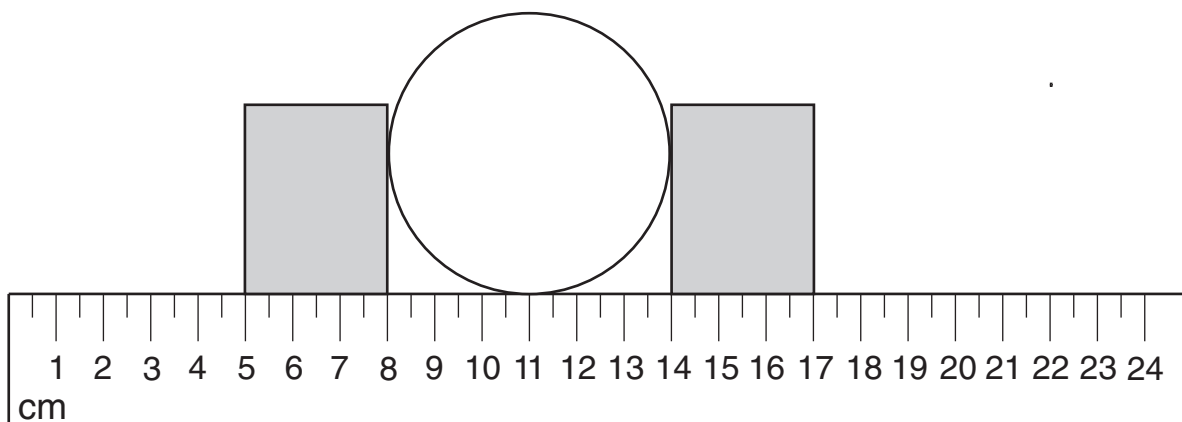
(1)

(2)

(3)

(4)

- 29 The diagram below shows a ball held in place by two blocks. The diameter (width) of the ball is shown between the two blocks.

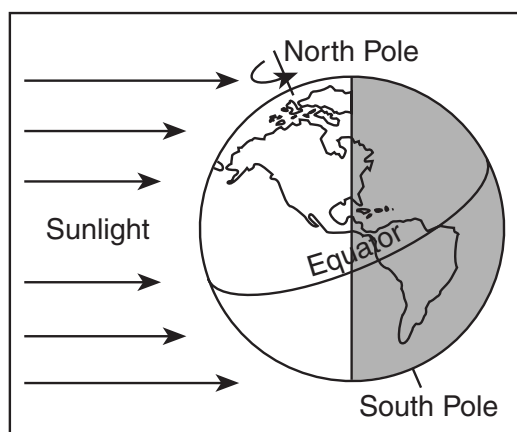


(Not drawn to scale)

What is the diameter of the ball?

- (1) 6.0 cm
(2) 8.0 cm
(3) 14.0 cm
(4) 17.0 cm

- 30 The diagram below shows Earth as viewed from space.



Which season is occurring in the Northern Hemisphere?

- (1) summer
(2) autumn
(3) winter
(4) spring

- 31 A chemical property of a mineral is evident if the mineral

- (1) breaks easily when struck with a hammer
(2) bubbles when acid is placed on it
(3) is easily scratched by a fingernail
(4) reflects light from its surface

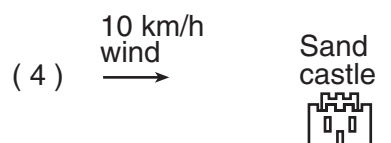
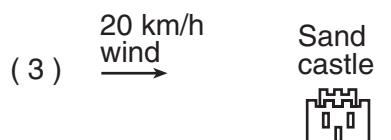
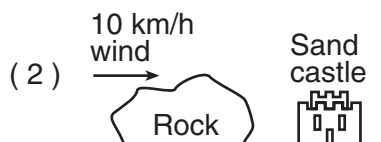
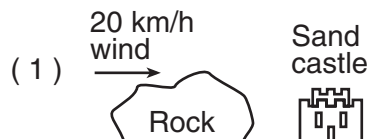
- 32 The bold line on the map below shows the San Andreas Fault.



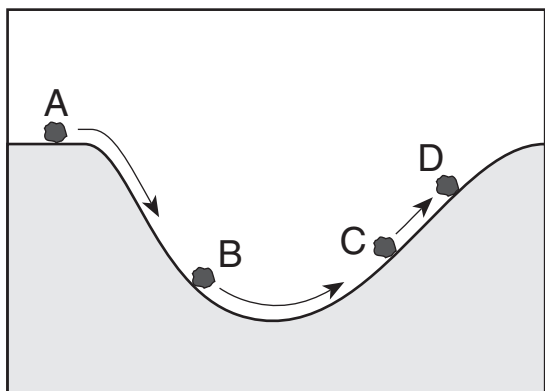
The San Andreas Fault is the result of

- (1) overpopulation
(2) a large glacier
(3) weathering and erosion
(4) crustal plate movement

- 33 Four identical sand castles are shown below. Which sand castle will most likely be eroded fastest by the wind?



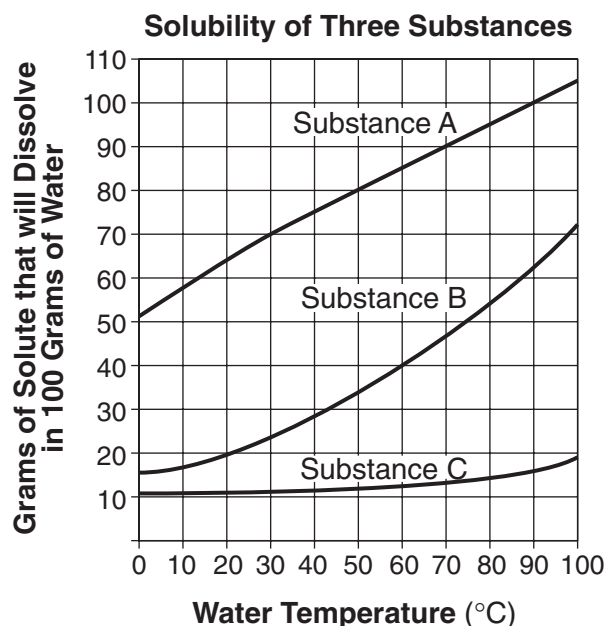
- 34 The diagram below shows a boulder rolling down a hill into a valley and then up the opposite hill.



At which position does the boulder have the greatest kinetic energy?

- (1) A (2) B (3) C (4) D

Base your answers to questions 35 and 36 on the graph below, which shows the solubility (amount that will dissolve in 100 grams of water) of three substances at various water temperatures.



- 35 Which statement is a correct interpretation of the data in the graph?

- (1) As water temperature increases, solubility decreases.
 (2) As water temperature increases, solubility increases.
 (3) As water temperature increases, solubility increases and then decreases.
 (4) As water temperature increases, solubility decreases and then increases.

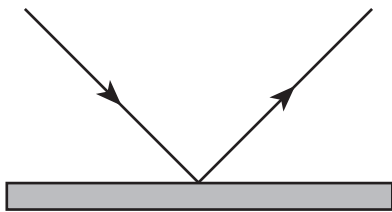
- 36 As the water temperature is increased from 30°C to 70°C, how many more grams of substance A will dissolve in 100 grams of water?

- (1) 20 g (2) 40 g (3) 50 g (4) 90 g

- 37 City administrators can encourage energy conservation by

- (1) lowering parking fees
 (2) building larger parking lots
 (3) decreasing the cost of gasoline
 (4) lowering the cost of bus and subway fares

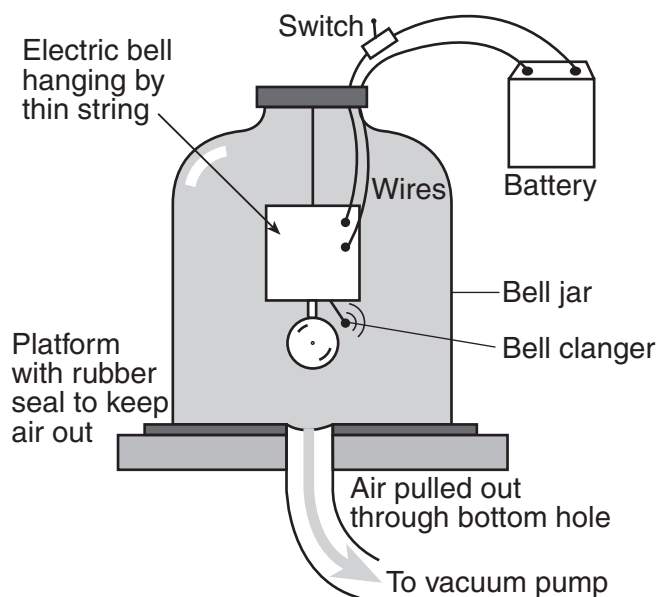
38 The diagram below shows a light ray.



In this diagram, the light ray is being

- (1) transmitted
- (2) absorbed
- (3) reflected
- (4) refracted

39 The picture below shows a ringing bell inside a vacuum jar.



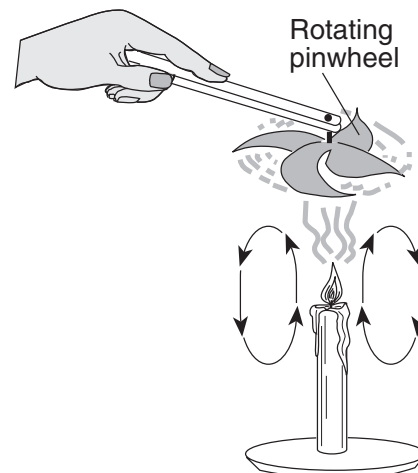
As air is pumped from the vacuum jar, the sound level of the ringing bell will decrease until it can no longer be heard. This happens because air must be present in the jar in order for

- (1) sound to be transferred
- (2) electricity to flow through the wires
- (3) the rubber to seal the jar
- (4) the bell clanger to vibrate

40 Which two factors determine the gravitational attraction between two objects?

- (1) time and temperature
- (2) shape and orbital speed
- (3) color and hardness
- (4) mass and distance apart

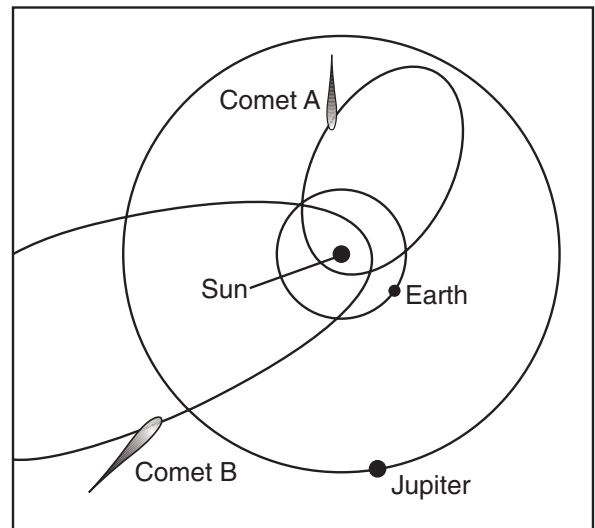
41 The diagram below shows a pinwheel rotating above a lit candle. The arrows indicate the direction of air flow.



Which energy transformation is best shown in this diagram?

- (1) heat to mechanical
- (2) mechanical to light
- (3) sound to heat
- (4) heat to sound

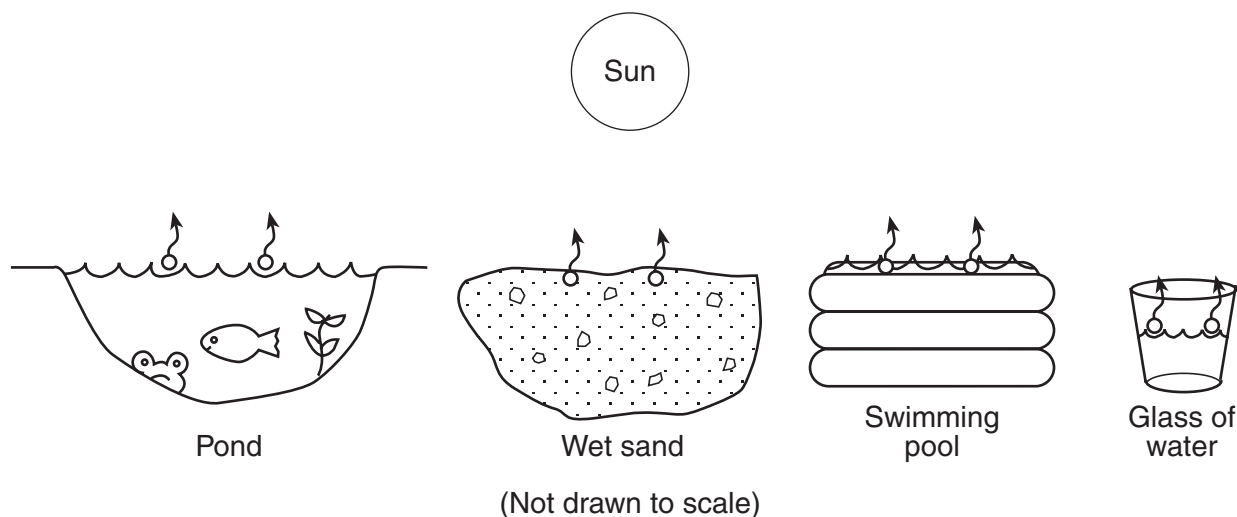
42 The diagram below shows four objects and their orbits around the Sun, as seen from space.



Which statement is true about *all* of the objects shown in the diagram?

- (1) They produce their own light.
- (2) They belong to our solar system.
- (3) They are composed mostly of gases.
- (4) They are the same distance from the Sun.

Base your answers to questions 43 and 44 on the diagrams below and your knowledge of science. The diagrams show liquid water changing to water vapor in four different situations.



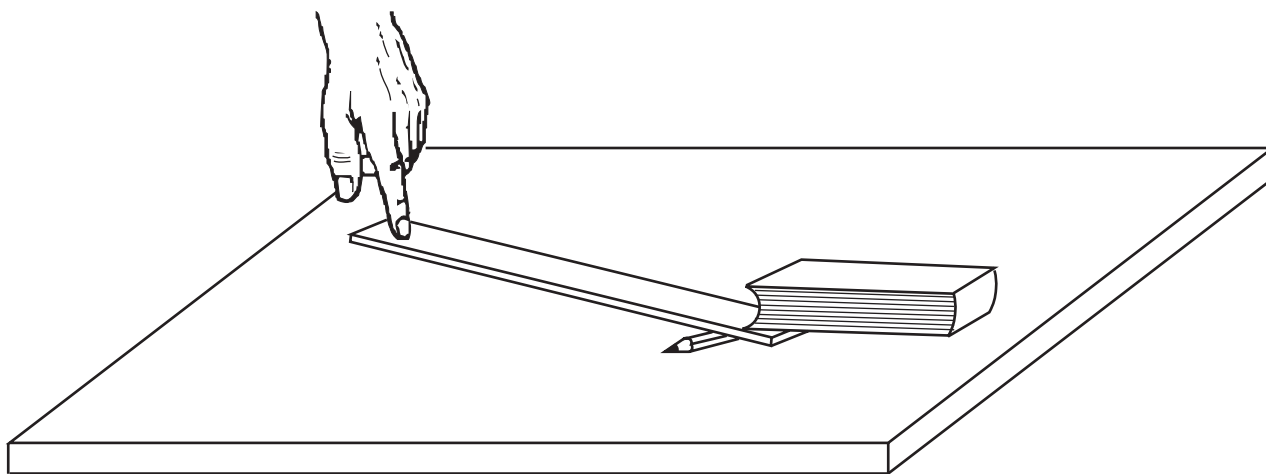
43 Which observation would be evidence that the water is undergoing a phase change?

- (1) Waves form on the top of the pond.
- (2) Water soaks into the wet sand.
- (3) The water splashes out of the swimming pool.
- (4) The water level in the glass of water decreases.

44 How is heat energy transferred within the liquid water in the pond?

- (1) compound formation
 - (2) convection currents
 - (3) chemical reactions
 - (4) nuclear reactions
-

45 The drawing below shows a person about to lift a book using a ruler and pencil.



This drawing illustrates an example of which simple machine?

- (1) gear
 - (2) pulley
 - (3) balance
 - (4) lever
-