

SCIENCE

Thursday, January 27, 2000 — 9:15 a.m.

There are 70 questions on this test of basic science concepts and skills. Your answers for questions 1 through 69 must be recorded on the separate answer sheet for multiple-choice questions. Use only a No. 2 pencil on that answer sheet. Your answer for question 70 is to be recorded in the spaces provided on the last page of this test booklet.

When you have completed the test, you must sign the declaration which states that you did not see any of the questions or answers before taking this test and that you have neither given nor received help in answering any of the questions during the test. Your answer papers cannot be accepted if you fail to sign this declaration.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO.

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THE STATE EDUCATION DEPARTMENT
ALBANY, NEW YORK 12234

DIRECTIONS TO STUDENTS

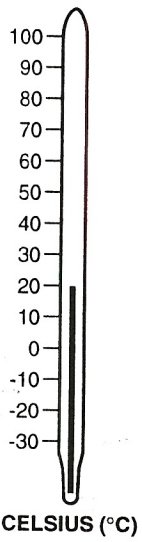
Questions 1 through 69 on this test are multiple-choice questions. Read each question carefully. Decide which of the choices given is the *best* answer, based on science principles. On the separate answer sheet, mark your answer in the row of circles for each question by filling in the circle that has the same number as the answer you have chosen.

Read the sample question below.

Sample Question

What temperature reading is shown on the thermometer?

(1) -30°C
(2) 20°C
(3) 70°C
(4) 100°C



CELSIUS ($^{\circ}\text{C}$)

The correct answer is 20°C , which is choice number **2**. On your separate answer sheet for the multiple-choice questions, look at the box showing the row of answer circles for the sample question. Since choice number **2** is the correct answer for the sample question, the circle with the number **2** has been filled in.

Answer questions 1 through 69 on this test in the same way. Mark only one answer for each question. If you want to change an answer, be sure to erase your first mark completely. Then mark the answer you want. You may use scrap paper and the blank spaces of this test booklet to work out the answers to the questions, but be sure to mark all your answers for questions 1 through 69 on the separate answer sheet.

Answer question 70 in the space provided on the last page of this test booklet. Do not make any marks for question 70 on the separate answer sheet. Specific directions for answering this question are given in the test booklet.

When you are told to start working, turn the page and begin with question 1. Work carefully and answer all the questions. Your score will be the number of questions you answer correctly.

1 The chart below shows the nutritional value of some common snacks.

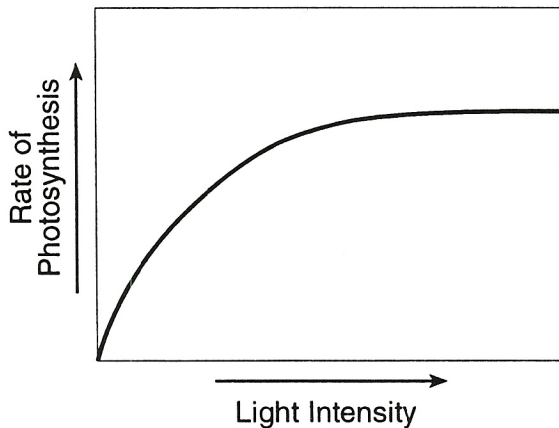
Nutritional Value of Some Common Snacks

	Fresh Orange Juice (1 cup)	Carbonated Drink (1 cup)	Raw Carrots (8 strips)	Chocolate Bar (1 oz)
Calories	110	96	20	145
Protein	2 g	0 g	1 g	4 g
Calcium	27 mg	0 mg	19 mg	22 mg
Iron	0.5 mg	0 mg	0.36 mg	1.9 mg
Vitamin C	124 mg	0 mg	7 mg	0 mg
Riboflavin	0.07 mg	0 mg	0.4 mg	0.1 mg

Compared to the other snacks listed in the chart, fresh orange juice provides the greatest

- (1) number of calories
- (2) amount of protein
- (3) amount of iron
- (4) amount of vitamin C

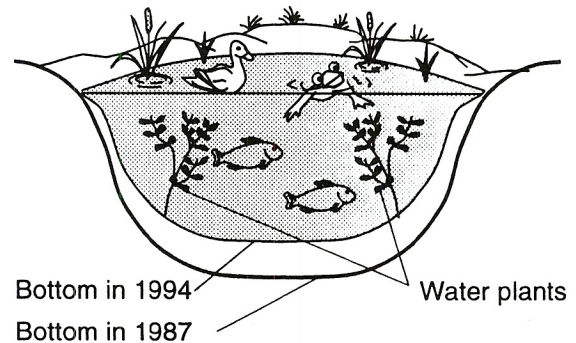
2 The graph below shows the relationship between the rate of photosynthesis and light intensity.



According to the graph, as light intensity increases, the rate of photosynthesis

- (1) decreases, only
- (2) decreases, and then remains the same
- (3) increases, only
- (4) increases, and then remains the same

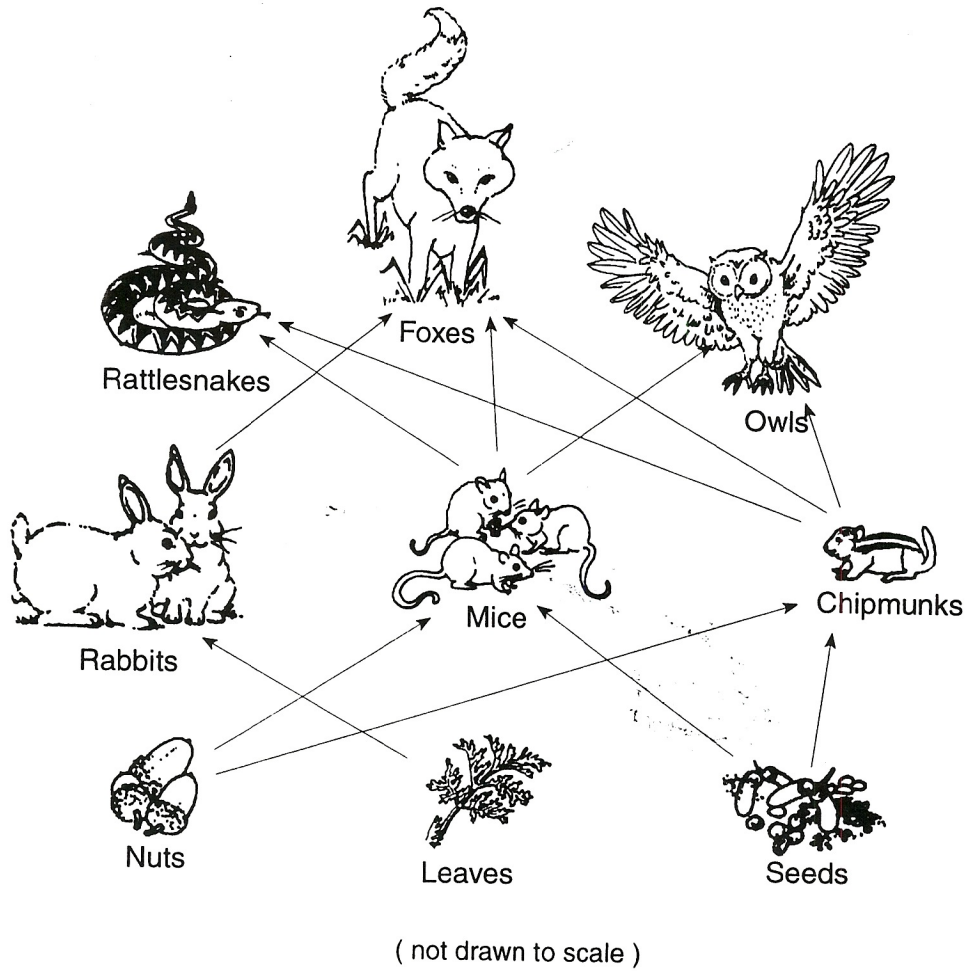
3 The diagram below represents a pond community.



As the pond fills in with sediment, the water plants will most likely be replaced by

- (1) ducks
- (2) grasses
- (3) fish
- (4) frogs

4 The diagram below shows a food web in a community.



How many consumer groups does this food web contain?

- (1) 7
- (2) 6
- (3) 3
- (4) 4

5 A horse obtains its food energy directly from

- (1) grass and other green plants
- (2) oxygen and carbon dioxide
- (3) water and sunlight
- (4) soil and decomposers

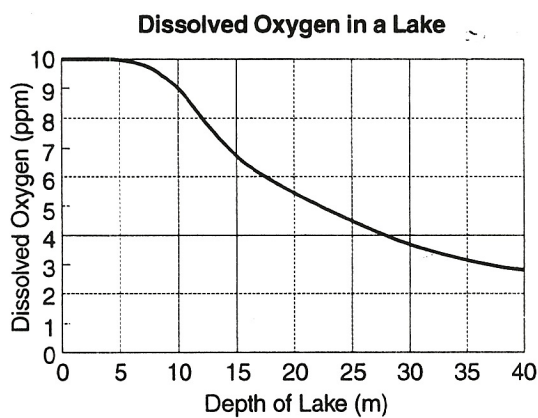
6 Which adaptation most likely increases an animal's chance of survival in arctic conditions?

- (1) curved beak
- (2) stripes
- (3) white fur
- (4) scales

7 Which organism is a decomposer?

- (1) fungus
- (2) human
- (3) cow
- (4) wolf

8 The graph below shows the amount of dissolved oxygen in parts per million (ppm) at various depths in a lake. Most fish cannot survive in water containing less than 4 parts per million of dissolved oxygen.



What is the greatest depth at which most fish could live in this lake?

- (1) 5.5 m
- (2) 15 m
- (3) 27.5 m
- (4) 35 m

9 What is the primary source of energy for the food-making process in a leaf?

- (1) carbon
- (2) water
- (3) carbon dioxide
- (4) sunlight

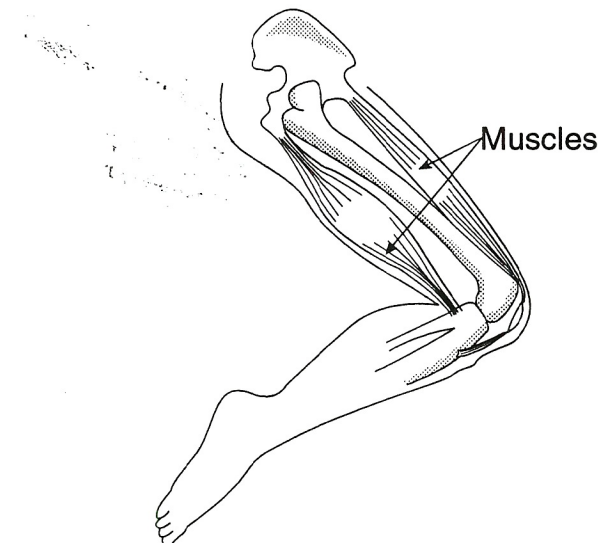
10 A food chain is shown below.

grass → grasshopper → frog → hawk

The arrows in the food chain represent

- (1) water evaporation
- (2) carbon dioxide
- (3) energy flow
- (4) electromagnetic waves

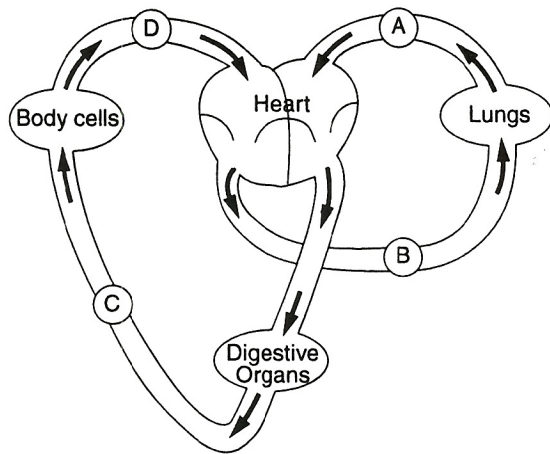
11 The diagram below shows part of the human body.



What is the main function of the structures shown in the diagram?

- (1) locomotion
- (2) digestion
- (3) excretion
- (4) respiration

12 The diagram below shows a model of the human circulatory system.



Blood containing the most food and oxygen is found at location

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

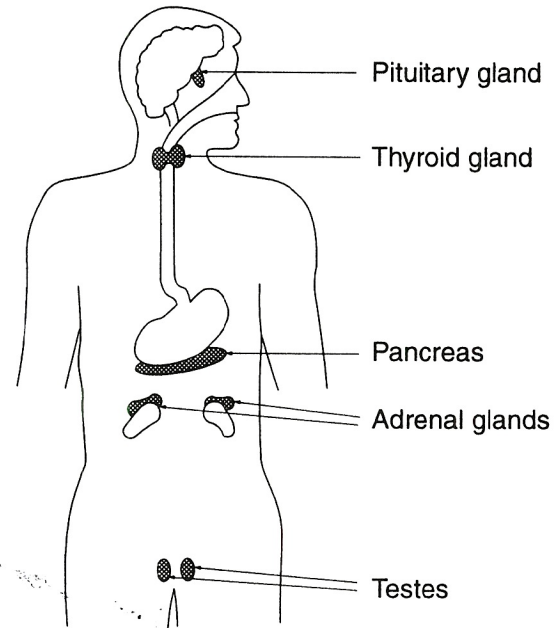
13 The table below shows the amount of caffeine in some foods and drinks.

Food/Drink	Caffeine (milligrams)
Cup of coffee	80
Cup of tea	40
Soft drink (cola)	40
Chocolate candy bar	10
Chocolate chip cookie	4

Which snack combination contains the greatest amount of caffeine?

- (1) chocolate chip cookie and soft drink
- (2) chocolate chip cookie and cup of tea
- (3) chocolate candy bar and soft drink
- (4) chocolate candy bar and cup of coffee

14 The diagram below shows a portion of the male human body.



Which human-body system includes the body parts labeled in the diagram?

- (1) endocrine
- (2) nervous
- (3) digestive
- (4) excretory

15 Which term best completes the statement below?

Muscle cells are to a heart as nerve cells are to a

- (1) liver
- (2) brain
- (3) small intestine
- (4) bone

16 Which system controls the water and mineral balance of the human body?

- (1) excretory
- (2) nervous
- (3) respiratory
- (4) muscular

17 Which two human body systems work together to coordinate and control body activities?

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

18 Which human body system includes the skull, ribs, spinal column, and cartilage?

- (1) nervous
- (2) digestive
- (3) skeletal
- (4) endocrine

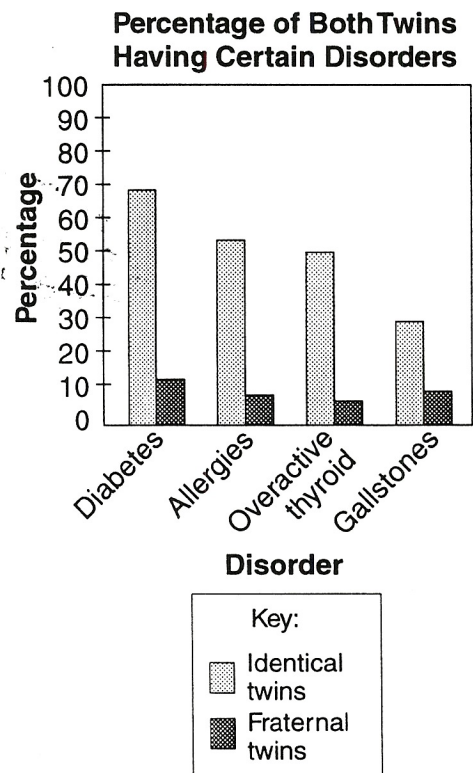
19 Some microorganisms in the soil help tree roots obtain minerals and water. These microorganisms provide the trees with

- (1) a benefit, only
- (2) a risk, only
- (3) both a benefit and a risk
- (4) neither a benefit nor a risk

20 Milk is pasteurized in order to

- (1) add vitamins and minerals
- (2) improve its taste
- (3) kill harmful microorganisms
- (4) make it easier to package

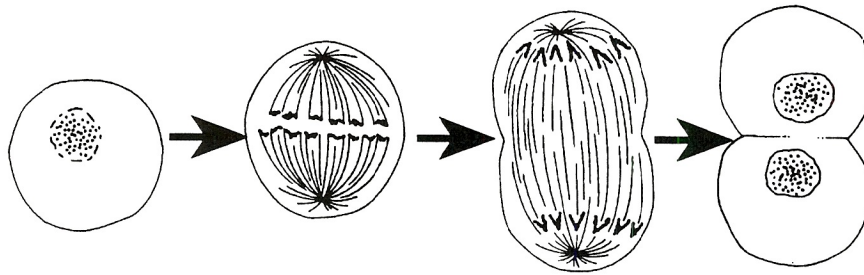
21 The graph below shows, in sets of twins, the percentage of both twins having certain disorders.



Which disorder has the *lowest* percentage of incidence for identical twins?

- (1) diabetes
- (2) allergies
- (3) overactive thyroid
- (4) gallstones

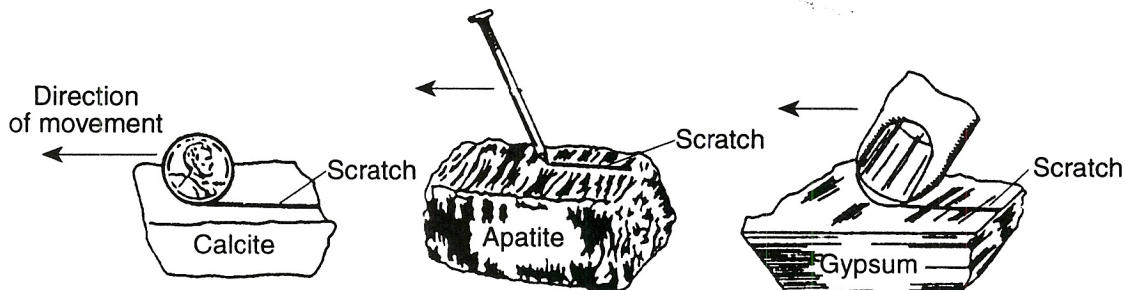
22 The diagram below shows a life process of a cell.



Which life process is shown?

- (1) reproduction
- (2) excretion
- (3) respiration
- (4) circulation

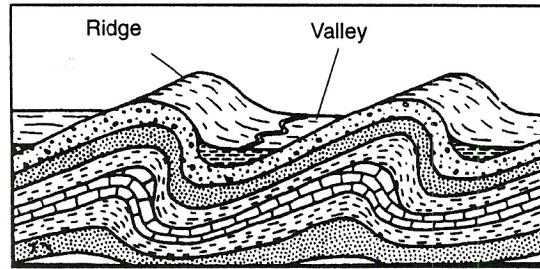
23 The diagrams below show tests for a property of minerals.



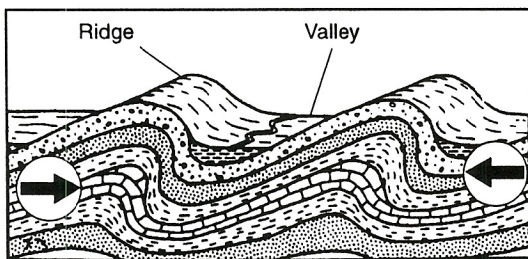
Which property is being tested?

- (1) color
- (2) hardness
- (3) cleavage
- (4) luster

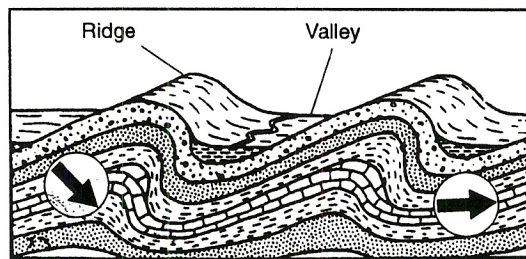
24 The diagram below shows a cross section of rock layers that have been folded.



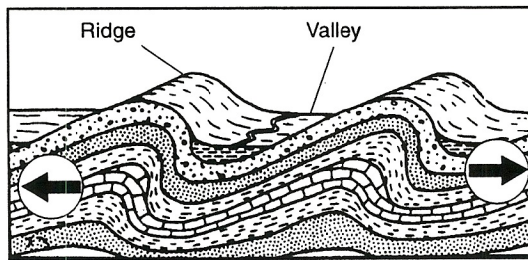
Which diagram shows arrows that would most likely indicate the direction of the forces that caused the layers to fold?



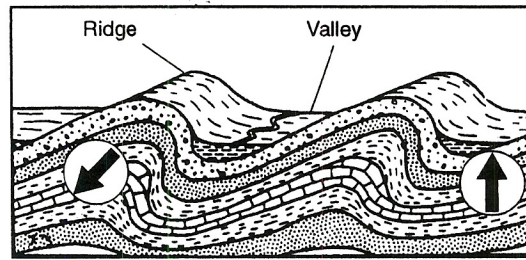
(1)



(3)

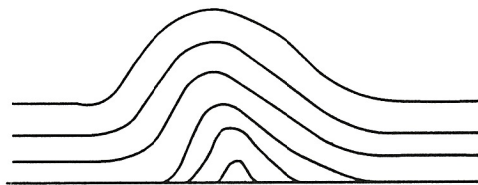


(2)



(4)

25 The diagrams below show the same cross section of Earth's crust as it may have looked millions of years ago and as it looks today.



Millions of Years Ago

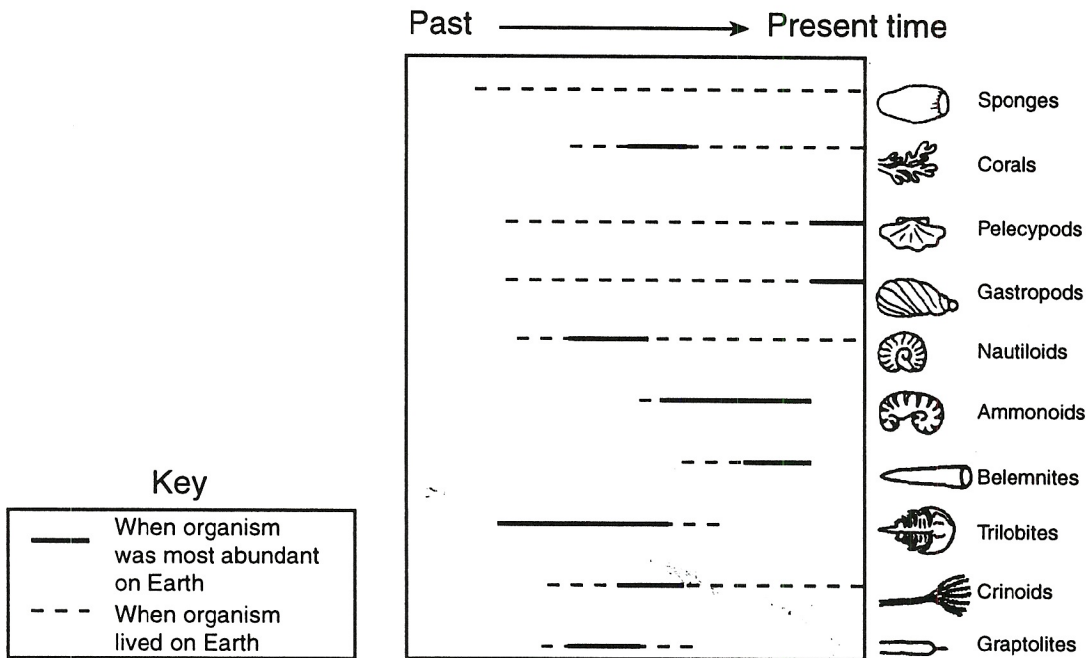


Today

The change shown was most likely caused by

- (1) volcanic eruptions
- (2) weathering and erosion
- (3) global warming
- (4) fossil formation and earthquakes

Base your answers to questions 26 through 28 on the chart below, which shows the span of time some organisms lived on Earth.



26 According to the chart, which two organisms are now extinct?

- (1) corals and belemnites
- (2) gastropods and graptolites
- (3) sponges and pelecypods
- (4) ammonoids and trilobites

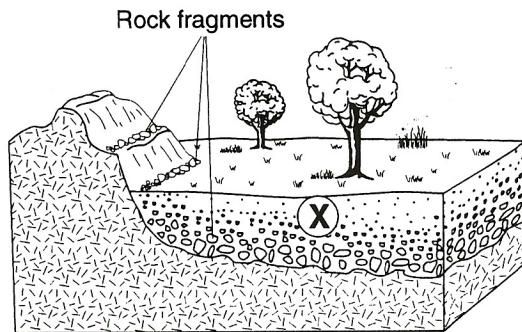
27 Which organisms in the chart are more abundant at the present time than they were in the past?

- (1) pelecypods
- (2) corals
- (3) nautiloids
- (4) crinoids

28 Based on the chart, which organisms have existed for the longest time on Earth?

- (1) trilobites
- (2) sponges
- (3) belemnites
- (4) corals

29 The diagram below shows a cross section of a portion of Earth's crust.



What is most likely located at point X?

- (1) bedrock
- (2) a glacier
- (3) soil
- (4) a fault

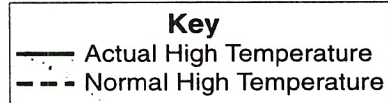
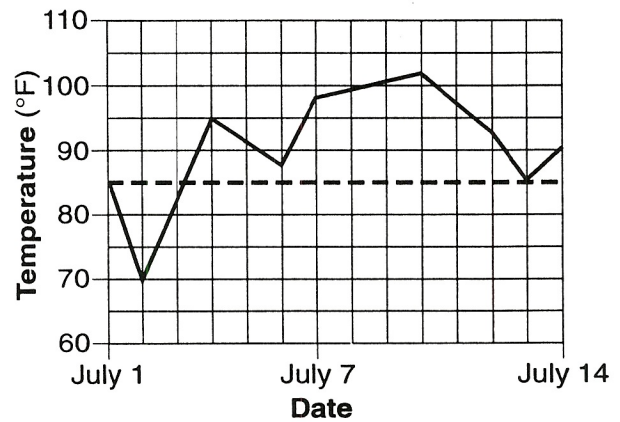
30 By which process does a water molecule leave the ocean and enter the atmosphere?

- (1) melting
- (2) condensation
- (3) precipitation
- (4) evaporation

31 Clouds form in the atmosphere when

- (1) rain falls
- (2) water freezes
- (3) water vapor condenses
- (4) water vapor is heated

32 The graph below shows the normal high temperature and the actual high temperature for New York City from July 1 to July 14 during a particular year.



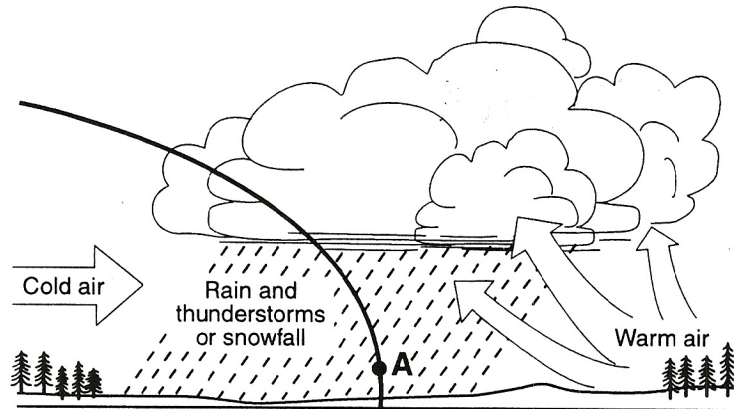
Compared to the normal high temperature, the actual high temperature for New York City on July 14 was

- (1) the same
- (2) 5° higher
- (3) 7° lower
- (4) 15° higher

33 Daily changes in weather are caused by the movement of

- (1) tides
- (2) air masses
- (3) satellites
- (4) glaciers

Base your answers to questions 34 and 35 on the diagram below. The diagram shows a side view of a cold air mass meeting a warm air mass.



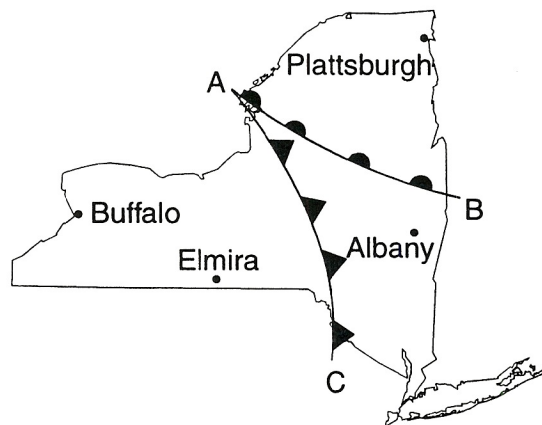
34 Why does the warm air rise upward over the cold air?

- (1) The warm air is less dense than the cold air.
- (2) The warm air is attracted to the moisture in the clouds.
- (3) The cold air is lighter than the warm air.
- (4) The cold air contains more moisture than the warm air.

35 In the diagram, point A is located

- (1) at the base of a cloud
- (2) at a frontal boundary
- (3) in the funnel of a tornado
- (4) near the end of a rainbow

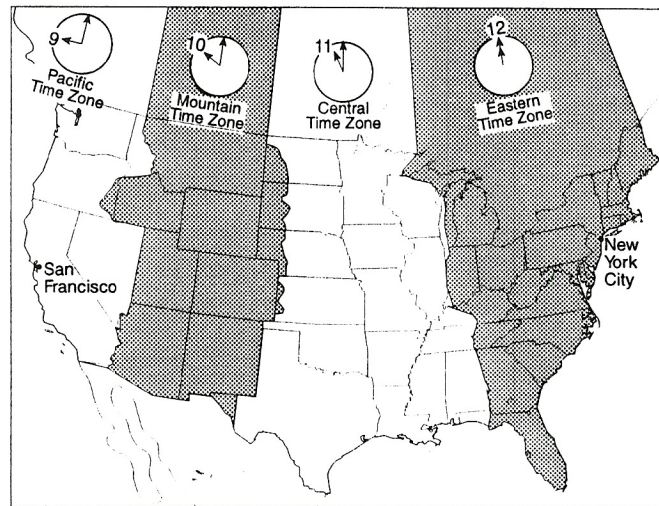
36 The weather map below shows a warm front along line AB and a cold front along line AC. The weather system is moving in a northeast track.



Which city's weather will most likely be influenced by the approaching warm front?

- (1) Albany
- (2) Buffalo
- (3) Elmira
- (4) Plattsburgh

Base your answers to questions 37 and 38 on the map below, which shows the boundaries of four time zones. The clocks show the time in each of the zones at the same instant.



37 The time of day in New York City is always later than the time in San Francisco because Earth

- (1) has seasons
- (2) orbits the Sun
- (3) rotates in an easterly direction
- (4) is tilted on its axis

38 When it is 5 p.m. in New York City, what time is it in San Francisco?

- (1) noon
- (2) 2 p.m.
- (3) 8 p.m.
- (4) 5 a.m.

39 Which table shows the correct data for the approximate sizes of Earth, the Moon, and the Sun?

(1)

Body	Approximate Diameter (kilometers)
Earth	3,500
Moon	12,700
Sun	1,390,000

(3)

Body	Approximate Diameter (kilometers)
Earth	12,700
Moon	3,500
Sun	1,390,000

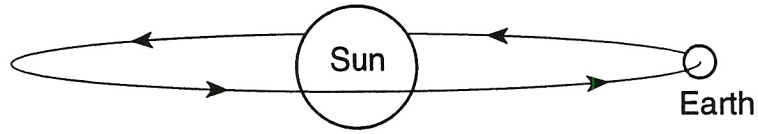
(2)

Body	Approximate Diameter (kilometers)
Earth	1,390,000
Moon	3,500
Sun	12,700

(4)

Body	Approximate Diameter (kilometers)
Earth	1,390,000
Moon	12,500
Sun	3,500

40 The diagram below represents Earth's path around the Sun.



(Not drawn to scale)

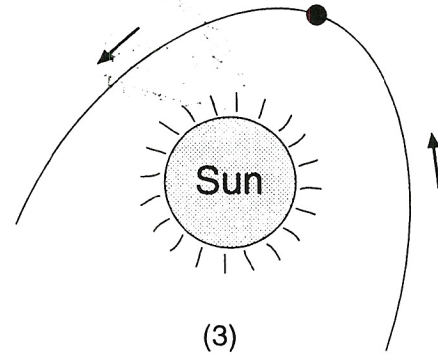
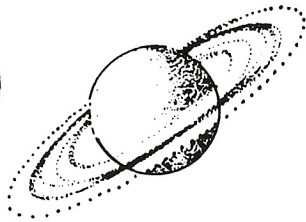
The motion of Earth represented in the diagram is called

- (1) a revolution
- (2) a vibration
- (3) spinning
- (4) wobbling

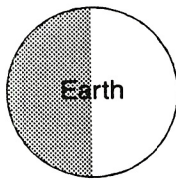
41 Which diagram below shows bodies that are *not* part of the solar system?



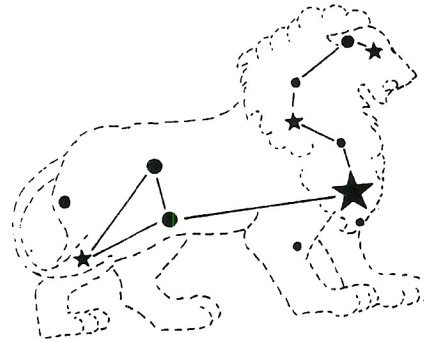
(1)



(3)

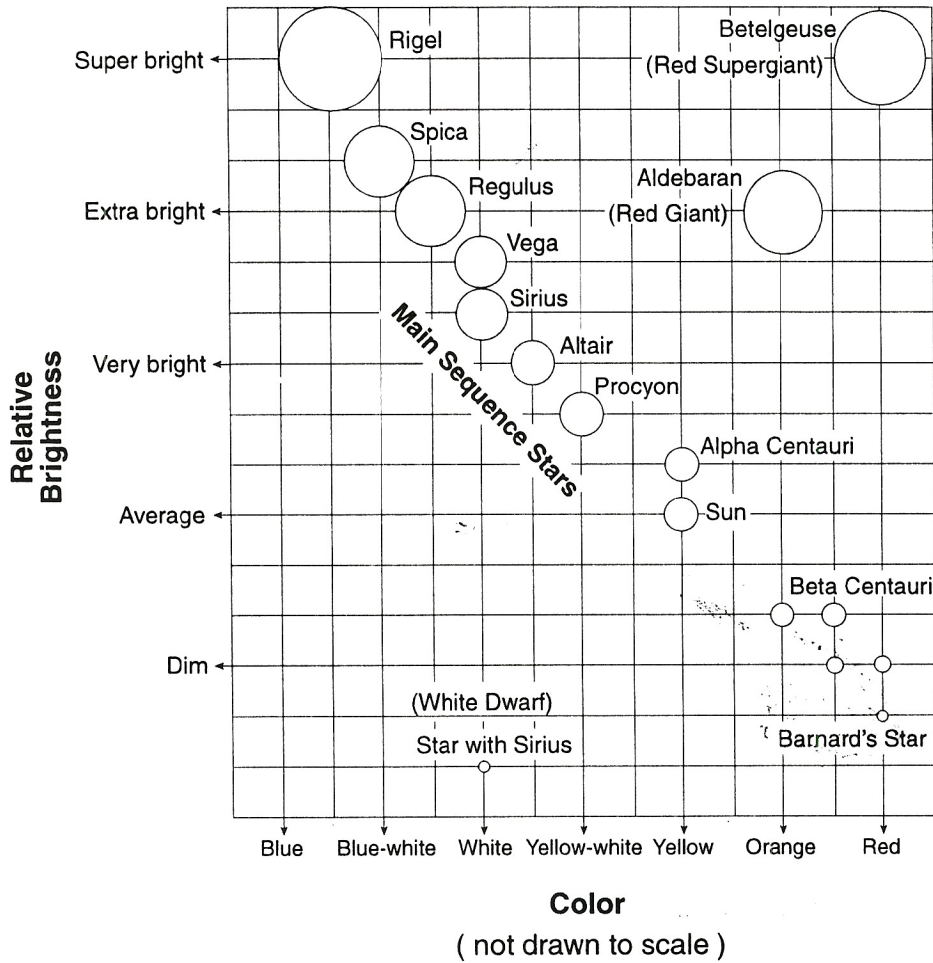


(2)



(4)

42 The star chart below shows the brightness and color of some stars.



According to the chart, the Sun is classified as

- (1) an average, yellow star
- (2) a dim, red star
- (3) an extra bright, orange star
- (4) a super bright, yellow star

43 An electric clothes dryer is grounded to prevent

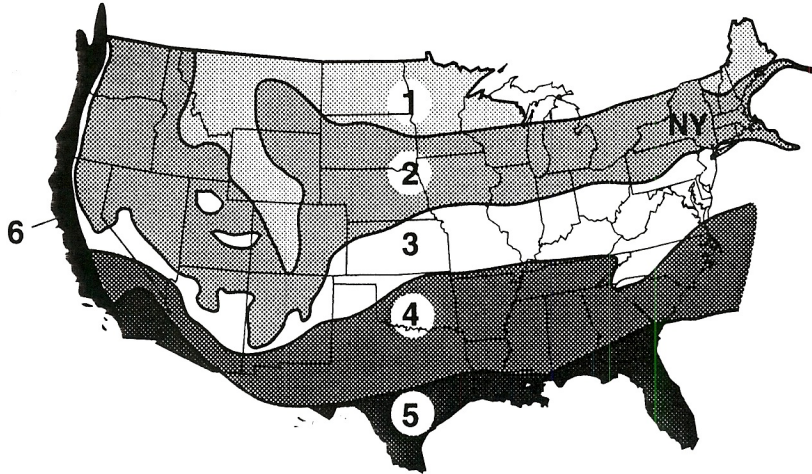
- (1) the twisting of its electrical cord
- (2) the motor from overheating
- (3) electrical shocks
- (4) the use of too much electricity

44 Sound waves can *not* travel through

- (1) water
- (2) rock
- (3) carbon dioxide
- (4) outer space

45 The map and table below show zones 1 through 6 in the continental United States and the recommended insulation R-values for those zones.

Recommended Insulation R-Values

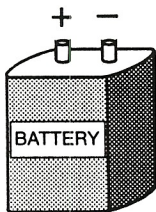


R-Value	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Ceilings	38	33	30	26	26	19
Walls	19	19	19	19	13	11
Floors	22	22	19	19	11	11

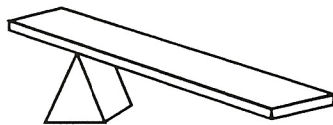
What are the recommended R-values for New York State?

- (1) ceilings 38, walls 19, floors 22
- (2) ceilings 33, walls 19, floors 22
- (3) ceilings 26, walls 19, floors 19
- (4) ceilings 26, walls 13, floors 11

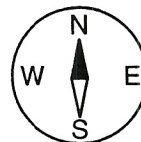
46 Which object is a simple machine?



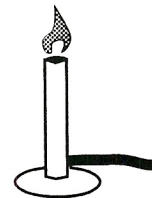
(1)



(2)

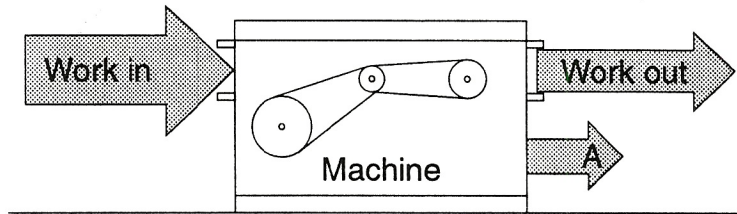


(3)



(4)

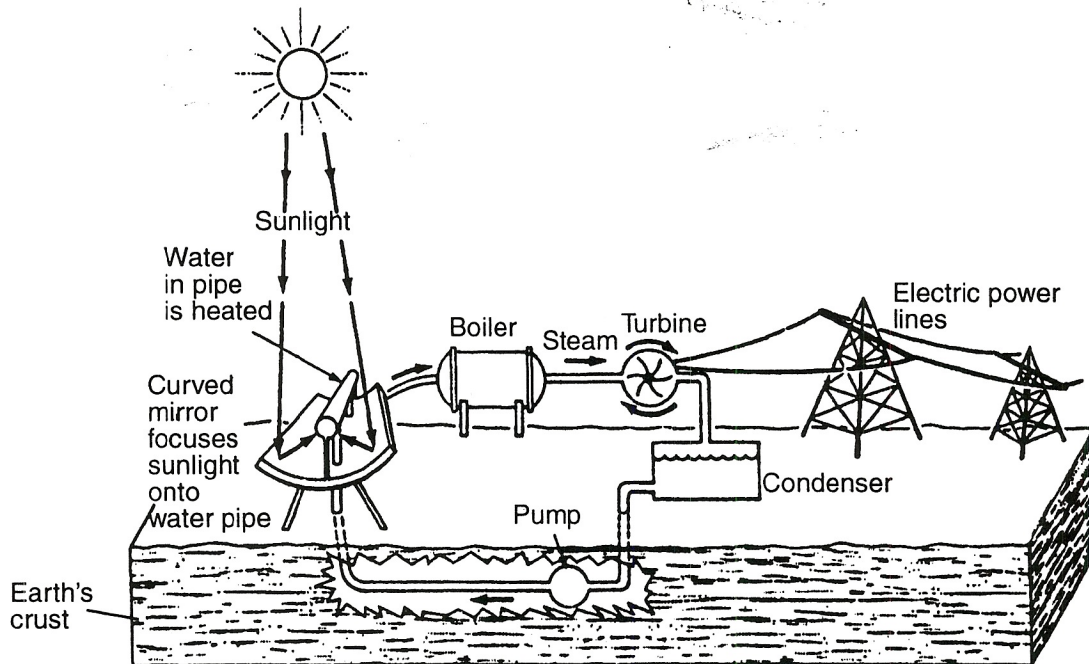
47 The diagram below is a model of the path that work takes when a machine is used. The amount of work put into the machine is equal to the amount of work out of the machine plus the amount shown by arrow A.



In the diagram, arrow A represents

- (1) light energy
- (2) lubrication
- (3) heat produced by friction
- (4) harmful vapors

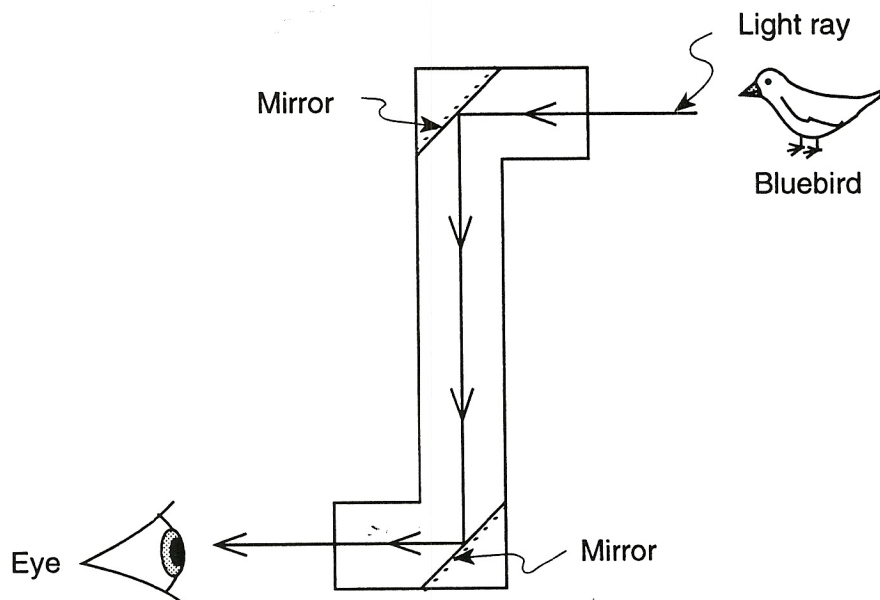
48 The diagram below shows a complex technological process.



What is the original energy source used to produce the electrical energy?

- (1) moving water
- (2) natural gas
- (3) wind
- (4) the Sun

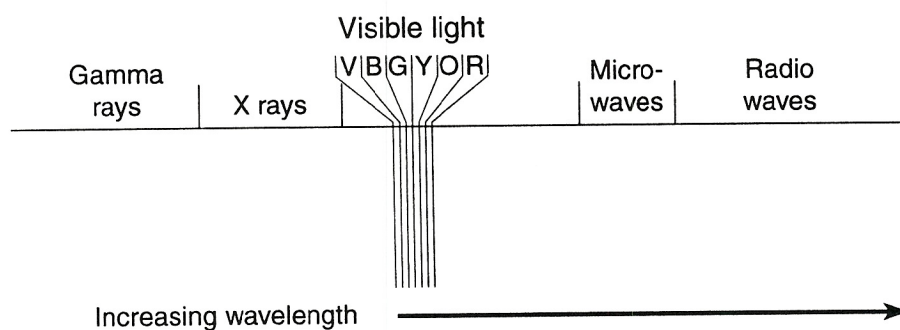
49 In the diagram below, a periscope is used to view a bluebird.



The function of the mirrors in the periscope is to

- (1) reflect the light
- (2) slow down the light
- (3) change the color of the light
- (4) increase the light's brightness

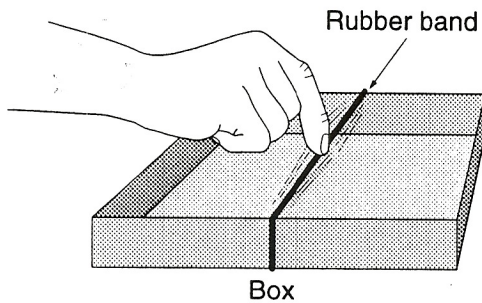
50 The diagram below represents energy that travels in waves.



Which form of energy is shown in the diagram?

- (1) sound
- (2) chemical
- (3) electromagnetic
- (4) mechanical

- 51 The diagram below shows a person plucking a rubber band stretched over an open box.



Which form of energy is being produced by the rubber band?

- (1) light
- (2) sound
- (3) chemical
- (4) magnetic

- 52 Which object has kinetic energy?

- (1) unused battery on a shelf
- (2) apple on a tree
- (3) baseball falling from a table
- (4) car parked on top of a hill

- 53 The warning label below appears on a guitar amplifier.

Warning: This amplifier is capable of producing high sound-pressure levels (in excess of 100 decibels). Wear ear protection when playing at high volume.

The label suggests that loud sound

- (1) has no effect on hearing
- (2) travels faster through solids
- (3) travels faster than light
- (4) can cause hearing loss

- 54 The table below shows the percent by volume of the elements that make up Earth's crust.

Composition of Earth's Crust

Element	Percent by Volume
Oxygen	94.0
Silicon	0.9
Aluminum	0.5
Iron	0.5
Calcium	1.2
Sodium	1.1
Potassium	1.4
Magnesium	0.3
All Others	0.1

According to the table, which three elements make up exactly 95.0% of Earth's crust by volume?

- (1) oxygen, silicon, and sodium
- (2) oxygen, silicon, and potassium
- (3) oxygen, aluminum, and iron
- (4) calcium, potassium, and magnesium

- 55 The label below appears on a can of household cleanser.

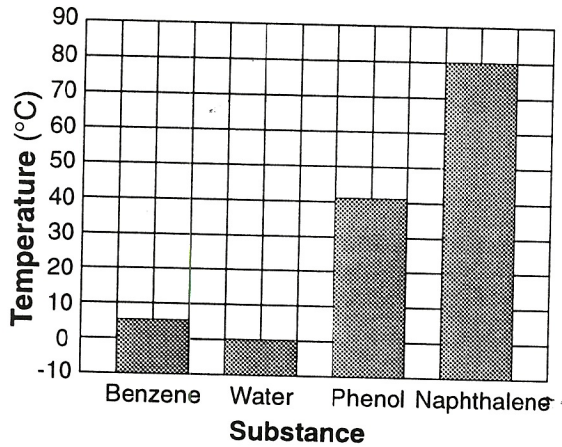
DANGER: Flammable. Harmful or fatal if swallowed. Vapor harmful. Eye and skin irritant.

According to the label, the cleanser in the can is

- (1) under pressure
- (2) inexpensive
- (3) safe to use around pets
- (4) hazardous

56 The graph below shows the freezing points of some substances.

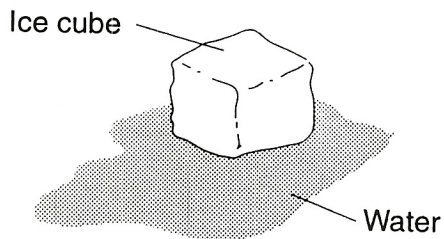
Freezing Points of Some Substances



Which substance is a solid at 60°C?

- (1) benzene
- (2) water
- (3) phenol
- (4) naphthalene

57 The diagram below shows an ice cube melting.

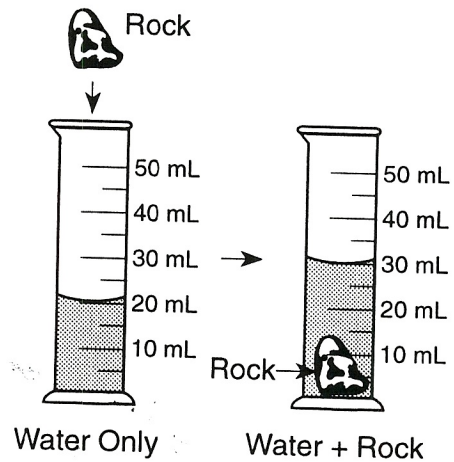


Which type of change is occurring?

- (1) nuclear
- (2) chemical
- (3) physical
- (4) electrical

Note that question 58 has only three choices.

58 The diagram below shows how the water level changes when a rock is added to water in a graduated cylinder.



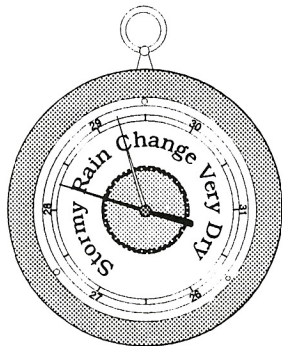
If the rock floated partially above the surface of the water instead of sinking, the water level in the graduated cylinder would be

- (1) lower than 30 mL
- (2) higher than 30 mL
- (3) 30 mL

59 If a liquid absorbs enough energy, the liquid will eventually

- (1) become a solid
- (2) become a gas
- (3) melt
- (4) condense

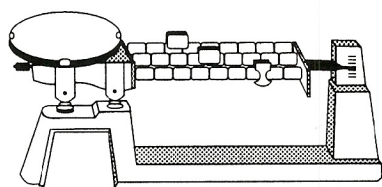
60 Which instrument would be most useful in determining if heat is released when two different chemicals are mixed?



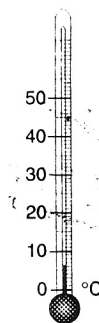
(1)



(3)



(2)



(4)

61 An energy resource is considered renewable if it can be

- (1) recycled naturally in a brief period
- (2) found in air and water
- (3) used to produce electricity
- (4) burned to produce heat

63 Which risk is associated with the use of nuclear power?

- (1) loss of forests
- (2) erosion of topsoil
- (3) loss of jobs
- (4) production of hazardous waste

62 Which activity does *not* require the use of a fossil fuel?

- (1) drying clothes in sunlight
- (2) manufacturing plastic bags
- (3) burning coal to produce electricity
- (4) heating water with natural gas

64 Over millions of years, fossil fuels were formed from

- (1) weathered rock fragments
- (2) dead plants and animals
- (3) recycled water
- (4) glaciers and meteors

65 The table below lists the average annual energy consumption of some household electric appliances in kilowatt-hours (kWh).

Appliance	Annual Energy Consumption (kWh)
Clock	17
Clothes dryer	993
Refrigerator/freezer	1,171
Stove	1,175
Television	440
Water heater	4,811

Which appliance uses the most energy in a year?

- (1) stove
- (2) refrigerator/freezer
- (3) clock
- (4) water heater

66 CFC's are manmade chemicals used in refrigeration and are believed to be destroying the ozone layer of Earth's atmosphere. Many countries have agreed to outlaw all use of CFC's.

This agreement is necessary because the use of CFC's

- (1) is a natural event causing an ecological disturbance
- (2) uses up solar energy without replacing it
- (3) has a negative long-term global impact
- (4) is more expensive than the use of other chemicals

67 In 1997, an unmanned spacecraft carrying scientific instruments landed on Mars. These instruments were used to find out about Martian rocks and soil. What does this situation show about technology?

- (1) It affects the environment.
- (2) It has long-term disadvantages.
- (3) It helps to advance science.
- (4) It decreases choices for society.

68 Many products once made from metal are now made from plastics. As a result, in which two industries has the number of people employed been directly affected?

- (1) steel and chemical
- (2) refrigeration and communication
- (3) logging and coal mining
- (4) food processing and solar energy

69 Today, people have different choices when buying recorded music than they did 20 years ago. Records have been almost completely replaced by cassettes and compact discs. This change is the result of

- (1) technology
- (2) pollution
- (3) conservation
- (4) tradeoffs

Directions (70): Record your response to question 70 in the space provided on the last page of this test booklet. Turn to the last page and fold it along the dotted line. Then tear it off slowly and carefully. Write your name and the other information requested in the spaces at the top of the page.

70 The table below shows the number of word processors used in a newsroom from 1975 to 1990.

**Word Processors
in a Newsroom**

Year	Number of Word Processors
1975	0
1980	10
1985	40
1990	50

Use the information in the table to construct a line graph on the grid shown on the answer sheet. Mark the location of each point with an **X**. Starting with the first point plotted, connect the points with straight lines.

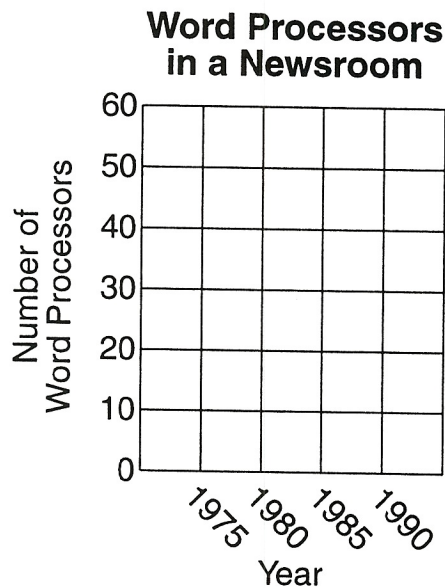
Student _____ Date of Birth _____ Sex: Male Female
 Grade _____
 School _____ City or P.O. _____
 Teacher _____ Today's Date _____

REGENTS COMPETENCY TEST

SCIENCE

Thursday, January 27, 2000 — 9:15 a.m.

Write your answer to question 70 on this answer sheet. Do not make any mark in the space for question 70 on your multiple-choice answer sheet.



When you have completed this part of the examination, be sure to sign the declaration printed on the bottom of your multiple-choice answer sheet. Make sure you hand in this answer sheet along with your multiple-choice answer sheet.