

REGENTS COMPETENCY TEST

SCIENCE

Thursday, June 22, 1995 – 9:15 a.m.

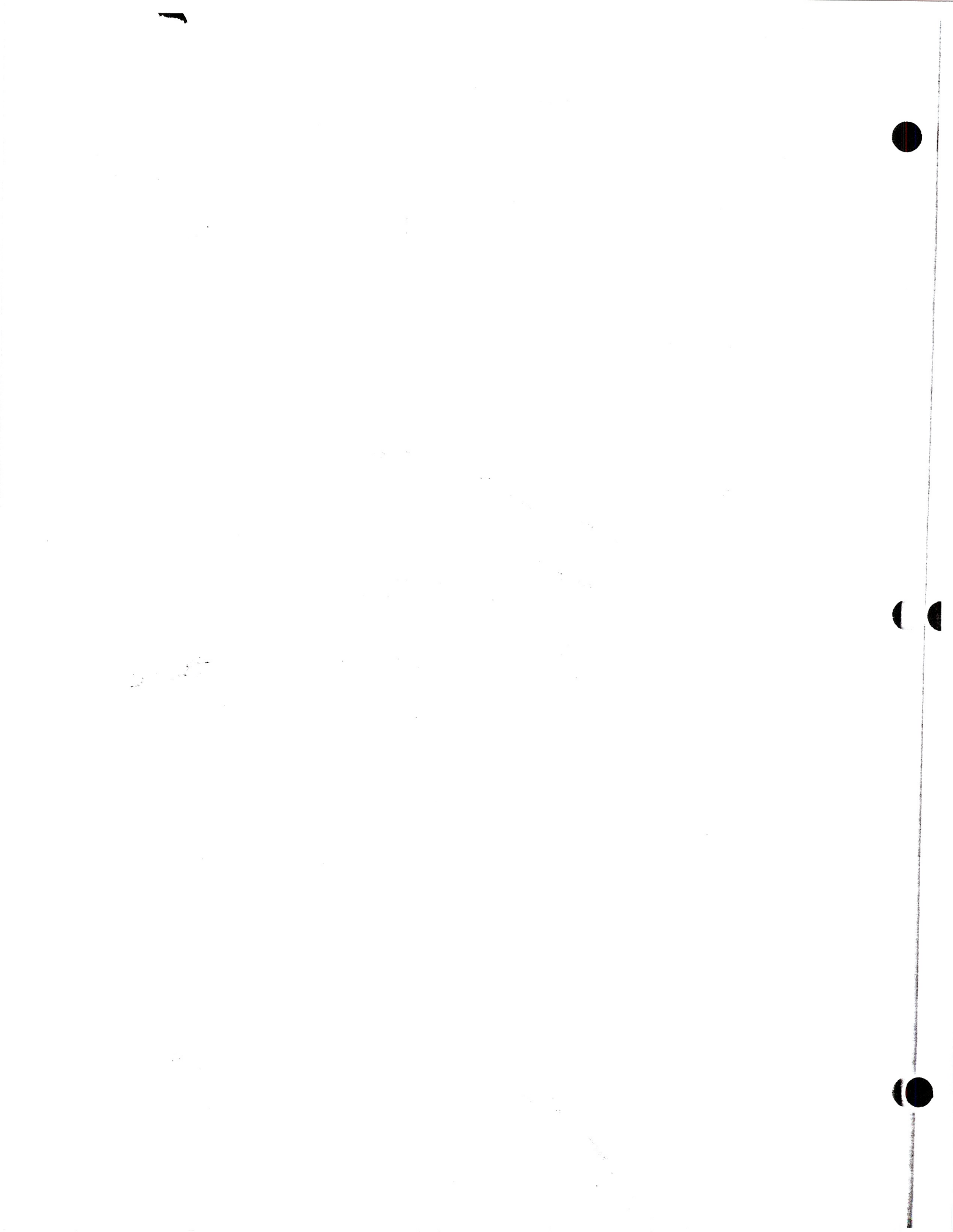
There are 70 questions on this test of basic science concepts and skills. Your answers for questions 1 through 69 must be recorded on the separate answer sheet for multiple-choice questions. Use only a black lead pencil on that answer sheet. Your answer for question 70 is to be recorded in the spaces 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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DIRECTIONS TO STUDENTS

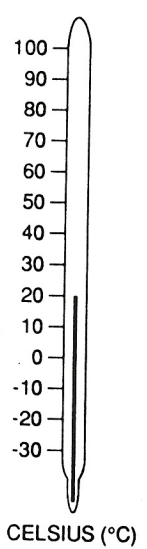
Questions 1 through 69 on this test are multiple-choice questions. Read each question carefully. Decide which of the choices given is the *best* answer, based on science principles. On the separate answer sheet, mark your answer in the row of circles for each question by filling in the circle that has 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 ($^{\circ}\text{C}$)

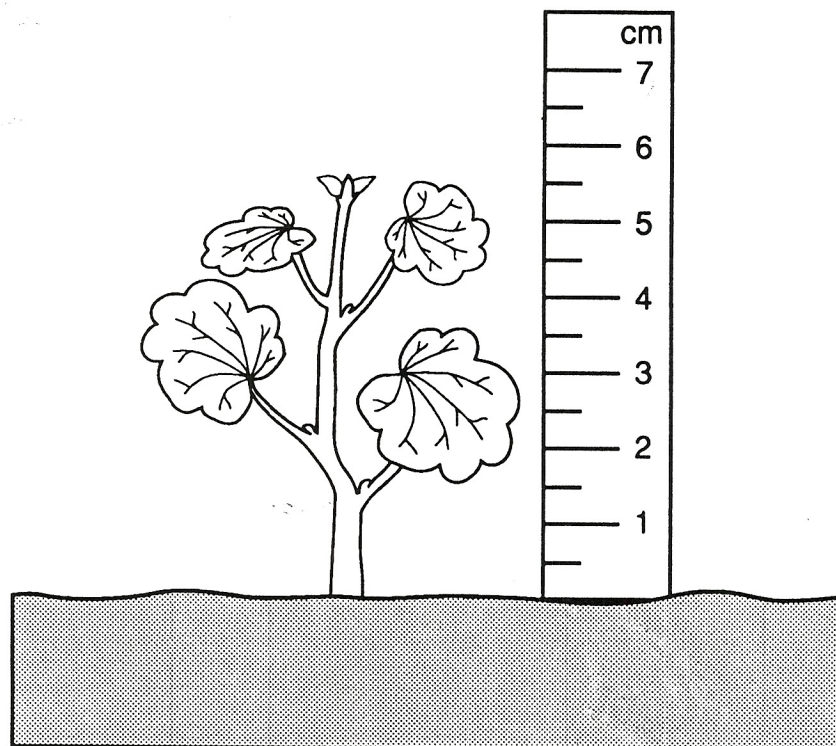
The correct answer is 20°C , which is choice number 2. On your separate answer sheet for the multiple-choice questions, look at the box showing the row of answer circles for the sample question. Since choice number 2 is the correct answer for the sample question, the circle with the number 2 has been 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 diagram below shows a ruler beside a seedling growing in soil.



What is the best estimate of this plant's height above the soil?

- (1) 3.5 cm
- (2) 4.5 cm
- (3) 5.5 cm
- (4) 6.5 cm

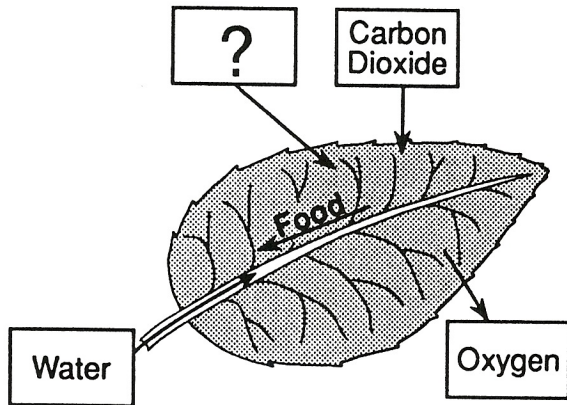
2 Insects obtain food energy from

- (1) plants or animals
- (2) the atmosphere
- (3) soil minerals
- (4) water or ice

3 Which gas do animals release as a waste product?

- (1) oxygen
- (2) carbon dioxide
- (3) hydrogen
- (4) nitrogen

4 The diagram below represents the process of photosynthesis in a green plant.



Which label is needed to complete the diagram?

- (1) light energy
- (2) bacteria
- (3) fertilizer
- (4) insecticide

6 Which life process results in new individuals?

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

7 A thick, waxy coating on the leaves of some desert plants most likely permits the plants to

- (1) reproduce quickly
- (2) conserve water
- (3) remain dormant
- (4) release food energy

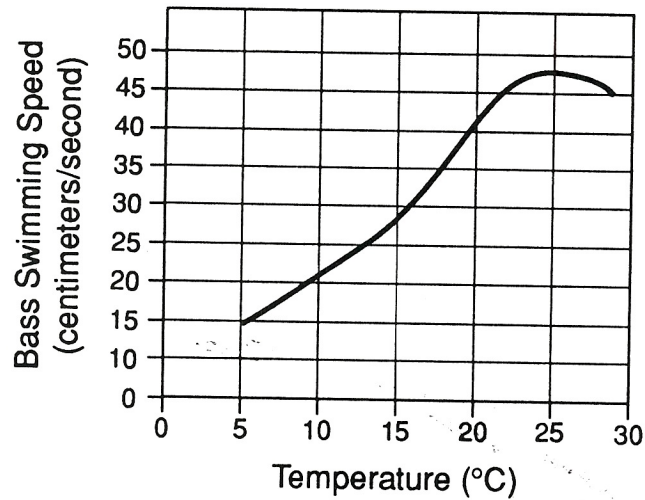
5 When the volcano Mt. St. Helens erupted, thousands of acres of forest were destroyed. Which statement best describes this event?

- (1) All living things come from other living things.
- (2) All organisms interact in an area to form a natural community.
- (3) The balance within ecosystems may be disturbed by natural events.
- (4) Natural communities always change in an orderly sequence.

8 An important reason for recycling mineral resources is that mineral resources are

- (1) replaceable
- (2) nonrenewable
- (3) abundant
- (4) inexpensive

Base your answers to questions 9 and 10 on the graph below, which shows the relationship between water temperature and the normal swimming speed of largemouth bass for the temperatures shown.



9 According to the graph, largemouth bass swim fastest when water temperatures are closest to

- (1) 5°C
- (2) 15°C
- (3) 25°C
- (4) 30°C

10 The change in swimming speed shown by the graph is an example of animals

- (1) responding to stimuli in their environment
- (2) migrating to a warmer climate
- (3) becoming dormant when temperatures are warmer
- (4) growing faster when temperatures are colder

11 The chart below gives information about some vitamins.

Vitamin Nutritional Information			
Vitamin	How used in body	Problems if not enough	Food sources
A (retinol)	vision, healthy skin	night blindness, rough skin	liver, broccoli, carrots
B ₁ (thiamine)	growth and repair	poor appetite, tired feeling	ham, eggs, raisins
B ₂ (riboflavin)	growth, healthy skin and hair	poor appetite, tired feeling	milk, yeast, eggs
B ₃ (niacin)	growth, helps body use nutrients	skin rash, diarrhea, poor appetite	peanuts, tuna, chicken
C (ascorbic acid)	healthy membranes, wound healing	sore mouth and bleeding gums, bruises	green peppers, oranges, lemons, tomatoes
D (calciferol)	bone growth	crooked legs, poor teeth	egg yolk, shrimp, milk, yeast

Which food is probably most useful for the proper development of the skeletal system?

- (1) liver
- (2) oranges
- (3) chicken
- (4) milk

12 Which term best completes the statement below?

Cell is to tissue as tissue is to

- (1) organism
- (2) system
- (3) organ
- (4) nucleus

13 Which structures are part of the same body system?

- (1) nerve and brain
- (2) heart and stomach
- (3) lungs and small intestine
- (4) skin and skull

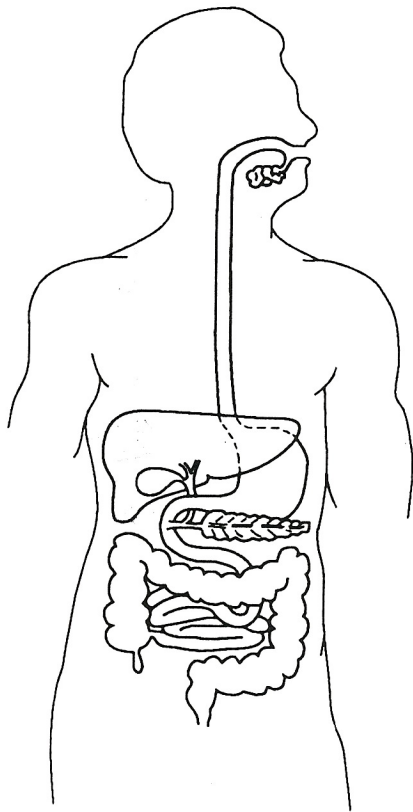
14 Which body structure moves by the action of voluntary muscles?

- (1) finger
- (2) small intestine
- (3) heart
- (4) liver

16 A dialysis machine is used to filter wastes from a person's blood. The function of a dialysis machine is most like the function of a

- (1) kidney
- (2) testis
- (3) stomach
- (4) bone

15 What human body system is represented in the diagram below?



- (1) circulatory
- (2) reproductive
- (3) digestive
- (4) nervous

17 A major difference between living things and nonliving things is that only living things are made of

- (1) atoms
- (2) cells
- (3) chemicals
- (4) elements

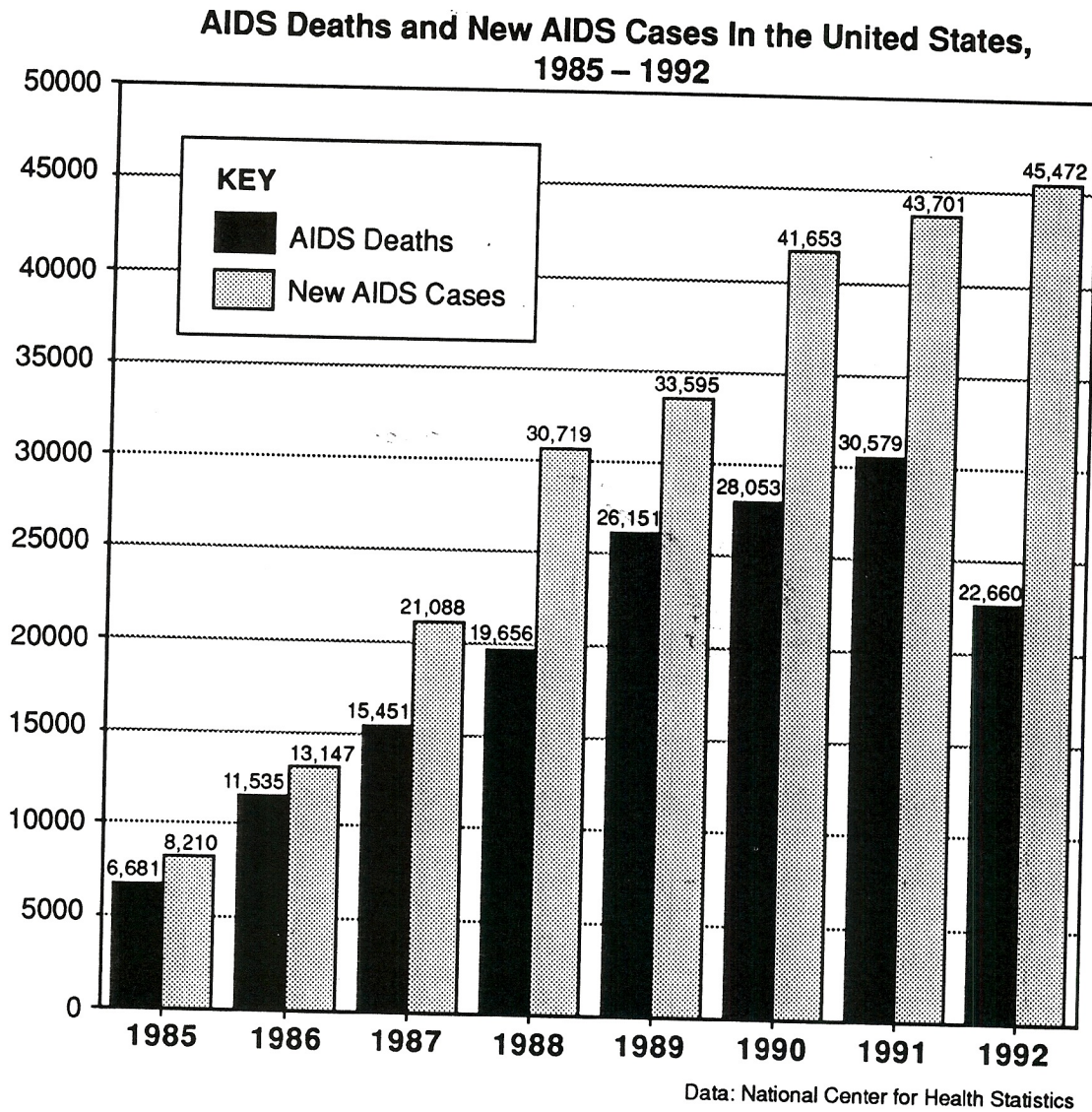
18 Which industry uses the processes of pasteurization, freezing, and refrigeration?

- (1) nuclear power industry
- (2) automobile industry
- (3) communications industry
- (4) food industry

19 Which instrument would a biologist most likely use to study a one-celled organism?

- (1) telescope
- (2) microscope
- (3) barometer
- (4) nuclear reactor

20 The graph below shows the number of deaths from AIDS and the number of new AIDS cases reported for each year from 1985 to 1992.

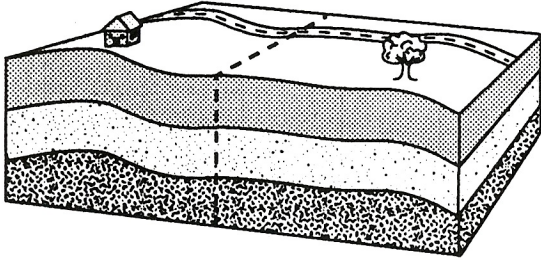


Which statement correctly describes information contained in the graph?

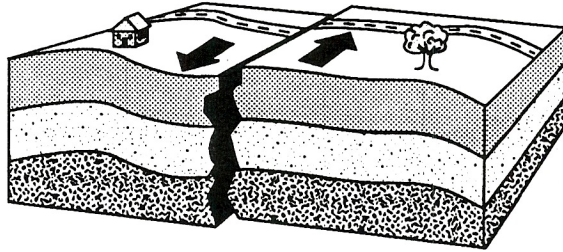
- (1) The number of deaths from AIDS increased each year from 1985 through 1992.
- (2) The number of new AIDS cases increased each year from 1985 through 1992.
- (3) Fewer new AIDS cases were reported in 1992 than in 1988.
- (4) The number of deaths from AIDS will probably decrease steadily through the 1990's.

Base your answers to questions 21 and 22 on the cross-sectional diagrams below, which show the same area before and after crustal movement.

Before Crustal Movement



After Crustal Movement



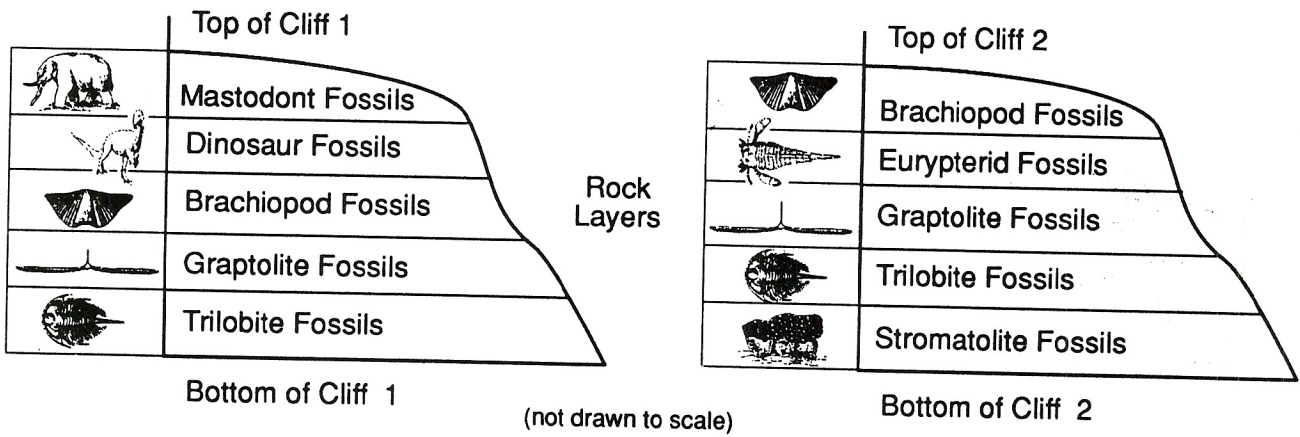
21 What most likely occurred because of the crustal movement shown?

- (1) a volcanic eruption
- (2) spreading of the ocean floor
- (3) an earthquake
- (4) fossil formation

22 Which type of crustal activity is shown by the diagrams?

- (1) bedrock formation
- (2) erosion
- (3) folding
- (4) faulting

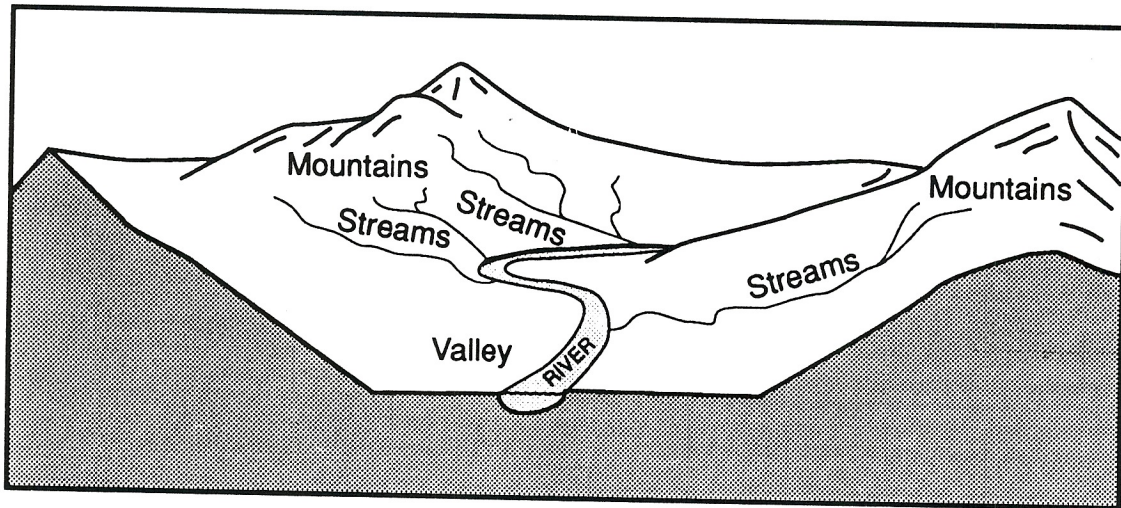
23 The diagrams below show two different cliffs. Each cliff is made up of five rock layers which contain fossils.



Which type of fossil is most likely the oldest?

- (1) stromatolite
- (2) trilobite
- (3) brachiopod
- (4) mastodont

24 The diagram below shows a drainage system.



Drainage systems like the one shown move weathered rock material from mountains to valleys to

- (1) different mountains
- (2) lakes or ocean basins
- (3) different continents
- (4) higher valleys

25 The data table below shows the density of four rock samples and the density of water.

Substance	Density (g/cm ³)
Sample A	0.7
Sample B	1.2
Sample C	0.9
Sample D	2.5
Water	1.0

Which rock samples will float in water?

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

26 Studies of the ocean floor have shown that the ocean floor has

- (1) tornadoes and glaciers
- (2) deserts and rain forests
- (3) plains and mountains
- (4) winds and fronts

27 The crust of Earth is composed mostly of

- (1) rocks
- (2) fossils
- (3) soils
- (4) oil

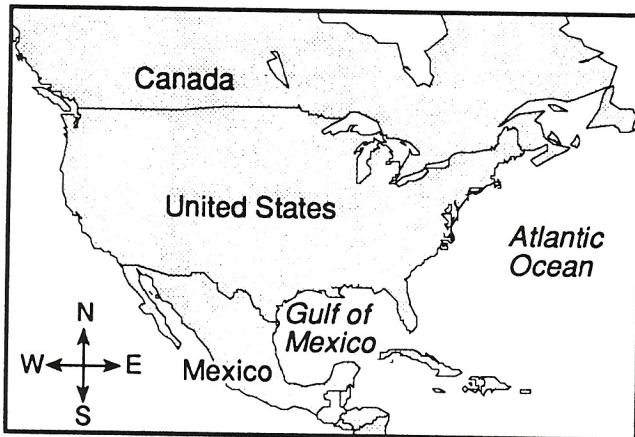
28 The boundary where two different air masses meet is called a

- (1) high
- (2) thunderstorm
- (3) front
- (4) fault

29 A low-pressure system moving over an area usually brings

- (1) summer
- (2) winter
- (3) clear, dry weather
- (4) cloudy, wet weather

30 The map below shows the location of Canada and the Gulf of Mexico.



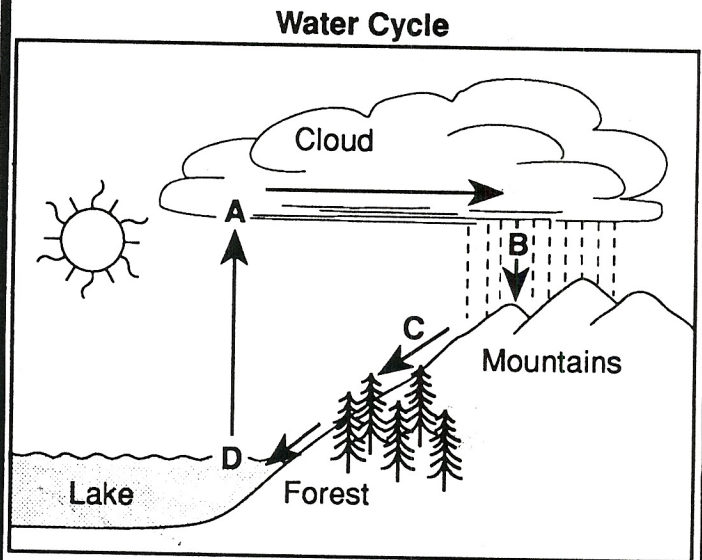
Compared to an air mass that formed over Canada, an air mass that formed over the Gulf of Mexico would be

- (1) warm and moist
- (2) warm and dry
- (3) cold and moist
- (4) cold and dry

31 An announcement has just been broadcast that a tornado has been observed less than a mile from a person's home. Where is the safest place to seek shelter?

- (1) on high ground
- (2) in a cellar
- (3) under a tree
- (4) at the top of a tall tree

32 The diagram below represents processes that are part of the water cycle.



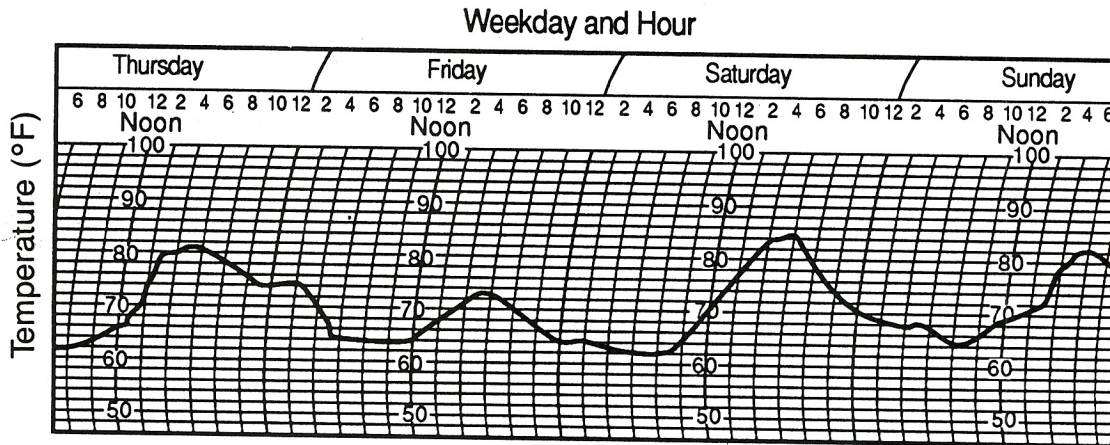
Which letter in the diagram shows the location where the greatest amount of evaporation would be taking place?

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

33 Most weather systems in New York State move across the State from

- (1) east to west
- (2) west to east
- (3) north to south
- (4) south to north

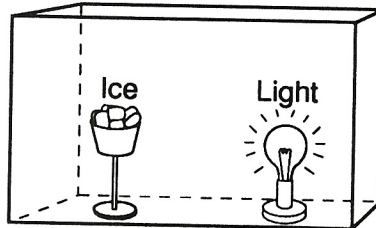
34 The graph below shows the temperature for a certain location over a period of time.



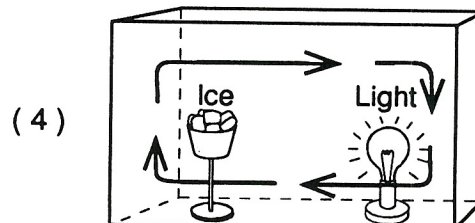
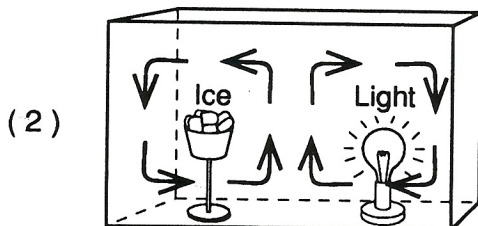
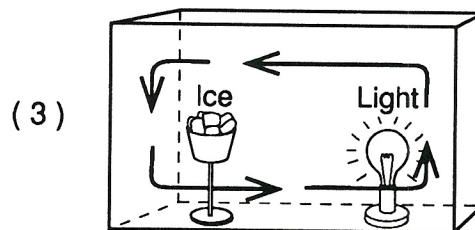
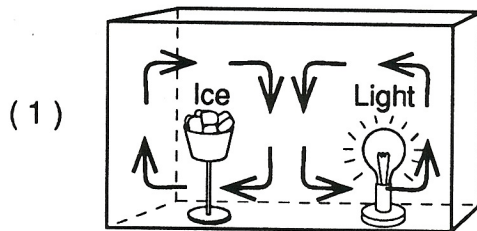
The highest daytime temperatures generally occurred between the hours of

- (1) 6 a.m. and 8 a.m.
- (2) 12 noon and 2 p.m.
- (3) 4 p.m. and 6 p.m.
- (4) 6 p.m. and 8 p.m.

35 The diagram below shows materials set up to demonstrate the effect of temperature on air circulation. The ice and light (heat source) are enclosed in a clear plastic box. A small amount of smoke is added to the box to make the movement of air visible.



Which diagram most accurately shows the movement of air in the box?



36 The table below shows the times of high tides and low tides for three days at a New York State location.

Date	High Tide	Low Tide
August 7	2:54 a.m. 3:19 p.m.	9:06 a.m. 9:31 p.m.
August 8	3:44 a.m. 4:09 p.m.	9:56 a.m. 10:21 p.m.
August 9	4:34 a.m. 4:59 p.m.	10:46 a.m. 11:11 p.m.

Which is the best prediction for the time high tide will occur on the morning of August 10?

- (1) 3:24 a.m.
- (2) 4:24 a.m.
- (3) 5:24 a.m.
- (4) 6:24 a.m.

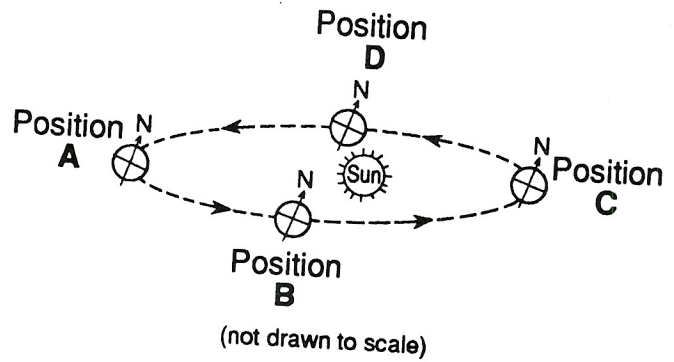
37 The change from day to night is caused by Earth's

- (1) rotation
- (2) diameter
- (3) changing distance from the Sun
- (4) changing distance from the Moon

38 Most meteors are made of

- (1) hot gases from the Sun
- (2) living material from space
- (3) ice crystals from planets
- (4) rock fragments from space

39 The diagram below shows Earth as it revolves around the Sun.



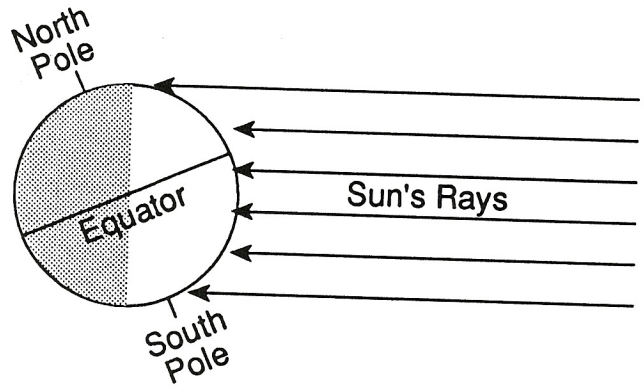
Six months after being at position A, Earth will be at position

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

40 To an astronaut standing on the Moon, the Sun appears smaller than Earth because the Sun

- (1) has less mass than Earth
- (2) is farther away than Earth
- (3) is only made of gas
- (4) does not radiate as much light as Earth

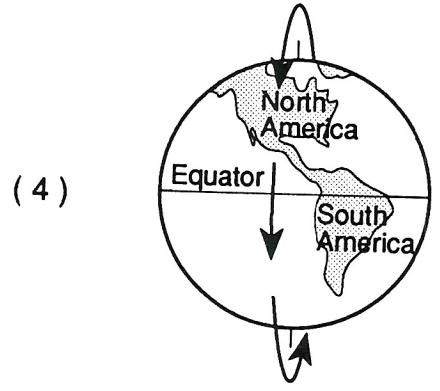
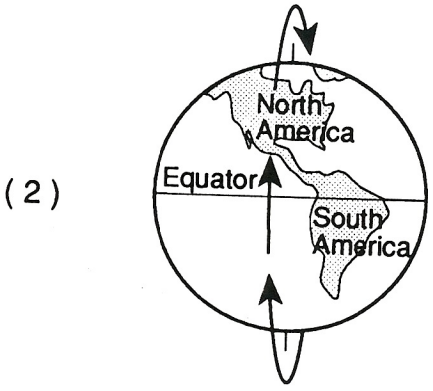
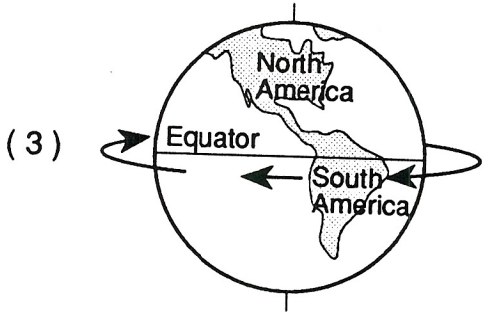
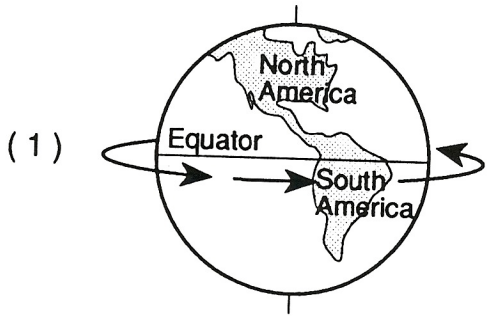
41 The diagram below shows a view of Earth from space.



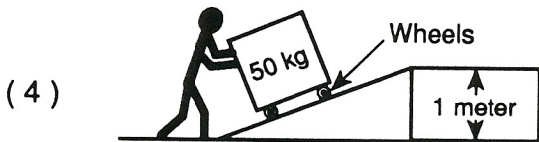
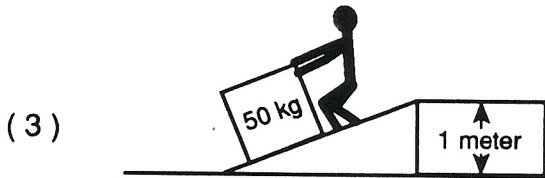
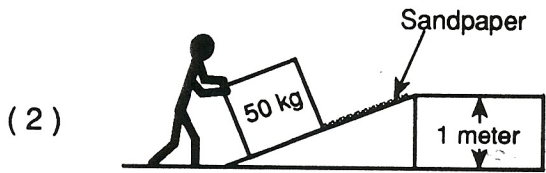
What is happening in the Northern Hemisphere at the time shown in the diagram?

- (1) Winter is beginning.
- (2) Spring is beginning.
- (3) The warmest temperatures are occurring.
- (4) The longest daylight hours are occurring.

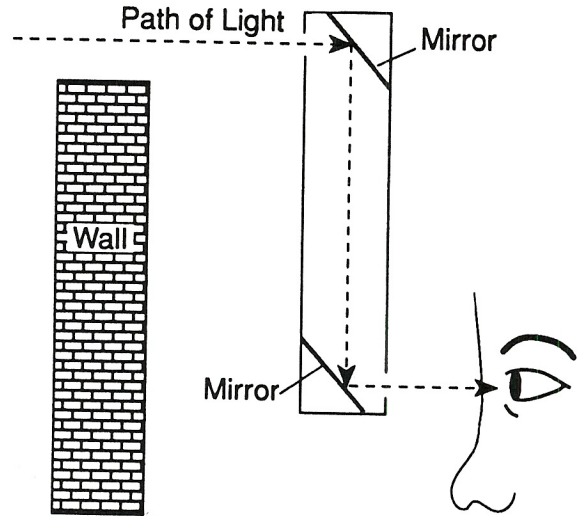
42 In which diagram below do the arrows indicate the direction in which Earth spins on its axis?



43 Which diagram shows the most efficient way to move the 50-kilogram weight up the ramp?



45 The instrument in the diagram below is a periscope, which allows a person to see over obstacles.



A property of light that allows the periscope to function is that light waves

- (1) bend around corners
- (2) travel in straight lines
- (3) cannot be reflected
- (4) move faster than sound waves

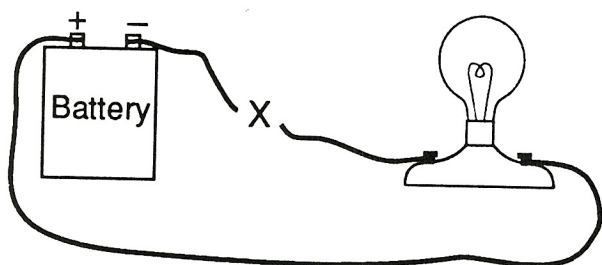
44 The performance of work requires

- (1) a machine
- (2) energy
- (3) water
- (4) a chemical change

46 An object has kinetic energy because of its

- (1) motion
- (2) volume
- (3) color
- (4) height

47 The diagram below shows an incomplete electrical circuit.



Which object, when connected to the wires at position X, would complete the circuit and light the bulb?

- (1) wooden matchstick
- (2) glass test tube
- (3) iron nail
- (4) rubber hose

48 The table below shows several types of electromagnetic energy and a common use of each type.

Wave Frequency	Type of Electromagnetic Energy	Common Use
lower	radio waves	communication
↓	microwaves	cooking foods
↓	infrared	heating
higher	x rays	medical tests

According to the table, the type of electromagnetic energy with the highest frequency is commonly used for

- (1) transmitting information
- (2) cooking foods
- (3) heating
- (4) diagnosing diseases

49 Which type of energy change occurs when a toaster is operating?

- (1) electrical energy to heat energy
- (2) mechanical energy to electrical energy
- (3) chemical energy to heat energy
- (4) heat energy to mechanical energy

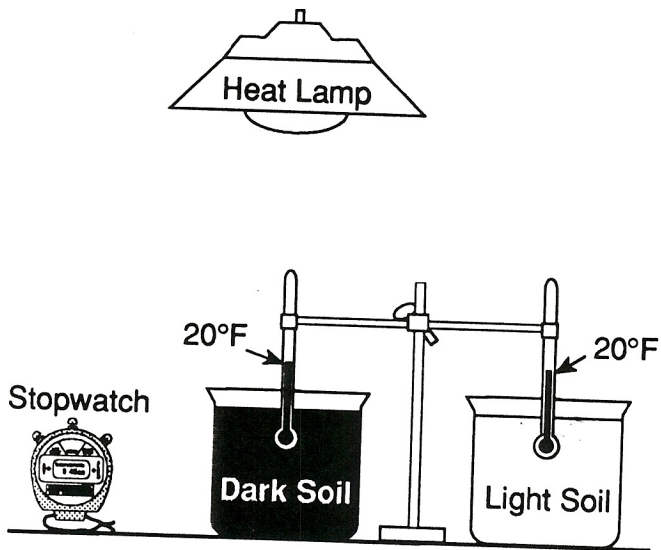
50 One way to reduce the amount of heat lost by a house during cold weather is to

- (1) increase the insulation in the attic
- (2) turn up the thermostat
- (3) use a wood-burning furnace instead of an oil-burning furnace
- (4) add blankets to the beds

51 The most important reason for a person to be careful when using electrical energy from a wall outlet is that electrical energy can

- (1) blow a fuse
- (2) produce harmful fumes
- (3) produce toxic wastes
- (4) cause a fatal shock

- 52 A student set up materials as shown below to investigate if dark soil heats up faster than light soil.



What is *wrong* with the setup of this investigation?

- (1) The temperature of both samples is 20°F.
- (2) One container has dark soil and the other container has light soil.
- (3) One container is directly under the heat lamp and the other container is not.
- (4) Both containers have the same shape.

- 53 Pressurized cans should not be punctured because they may

- (1) be recycled
- (2) explode
- (3) heat up
- (4) release radiation.

- 54 The label below lists the first-aid procedures to follow after different kinds of contact with a certain chemical cleanser.

IMMEDIATELY GIVE FIRST AID:

EYES: Immediately flush eyes with water for 20 minutes. (Remove contact lenses first.)

SKIN: Rinse immediately with water for 15 minutes.

INTERNAL: Rinse mouth. Drink a glassful of water or milk. Do not cause vomiting.

According to the label, if a child drinks some of this cleanser, what type of first aid should be given?

- (1) Make the child vomit, and then give the child water to drink.
- (2) First rinse the child's mouth, and then have the child drink water.
- (3) Call a doctor first, then rinse the child's eyes.
- (4) Immediately rinse the child's eyes with water for 20 minutes.

- 55 Which natural phenomenon is an example of matter?

- (1) a heat wave
- (2) a thunderclap
- (3) a storm cloud
- (4) a lightning bolt

56 The chart below shows where some common acids may be found.

Name of Acid	Where Found
Acetic acid	Vinegar
Ascorbic acid	Tomatoes, citrus fruits, vegetables
Carbonic acid	Rainwater, soft drinks
Hydrochloric acid	Gastric juice in stomach

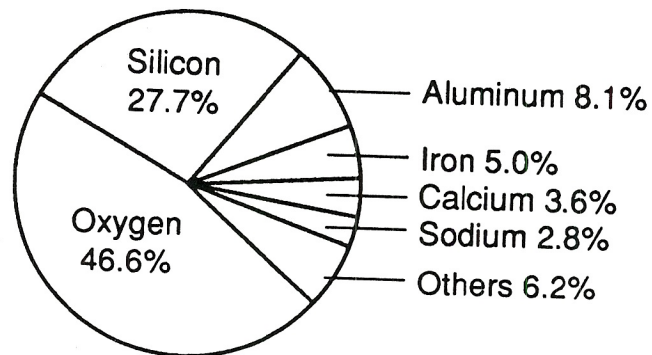
Which acid is found in some fruits?

- (1) acetic acid
- (2) ascorbic acid
- (3) carbonic acid
- (4) hydrochloric acid

57 Which phase change occurs as heat is added to a substance at its melting point?

- (1) liquid to gas
- (2) gas to liquid
- (3) liquid to solid
- (4) solid to liquid

58 The diagram below shows the percentage, by mass, of elements in Earth's crust.



Which two elements make up almost three-quarters of the mass of Earth's crust?

- (1) sodium and oxygen
- (2) aluminum and silicon
- (3) silicon and oxygen
- (4) calcium and sodium

59 In a solution of sugar and water, all of the sugar can be recovered by evaporating the water. This information shows that dissolving is

- (1) a pressure change
- (2) a physical change
- (3) an electromagnetic change
- (4) a chemical change

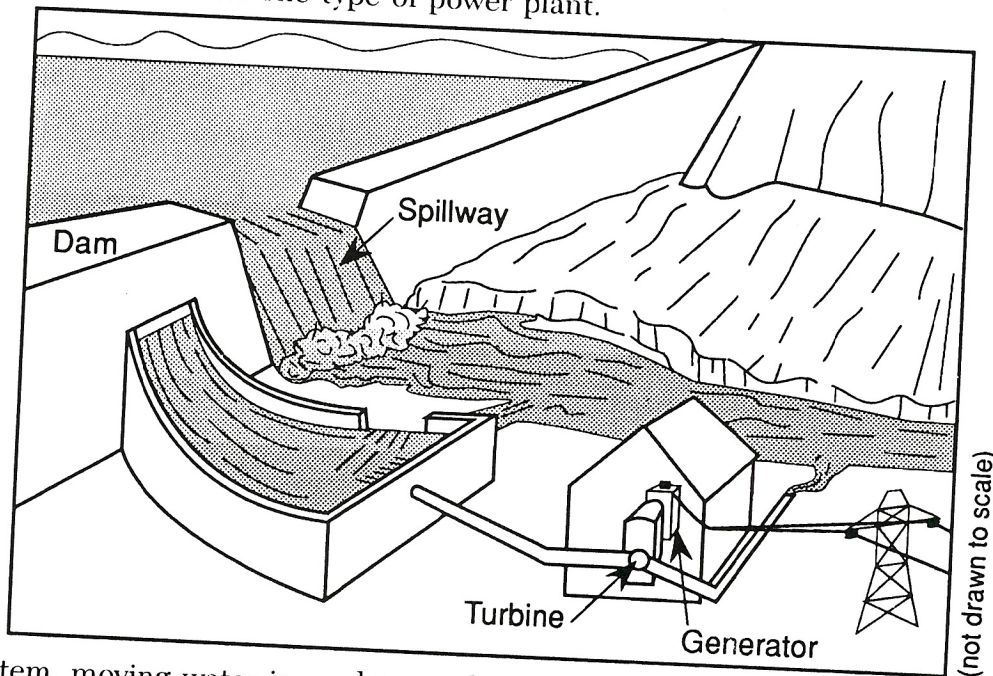
60 The table below lists properties of three substances. Sodium chloride forms when sodium and chlorine combine.

Substance	State (at room temperature)	Color	Additional Property
Sodium	metallic solid	silver	explosive in water
Chlorine	gas	pale yellow	poisonous
Sodium chloride	crystalline solid	white	used to flavor food

According to the table, sodium chloride has properties which are

- (1) the same as those of sodium, but not chlorine
- (2) the same as those of chlorine, but not sodium
- (3) the same as those of both sodium and chlorine
- (4) different from those of sodium and chlorine

61 The diagram below shows one type of power plant.



In this system, moving water is used to produce

- (1) solar energy
- (2) wind energy
- (3) chemical energy
- (4) electrical energy

62 Which list of energy sources contains only fossil fuels?

- (1) oil, coal, natural gas
- (2) coal, natural gas, solar energy
- (3) natural gas, solar energy, nuclear energy
- (4) nuclear energy, oil, solar energy

65 Which human activity is a better example of technology than of science?

- (1) inventing the compact disc player
- (2) classifying plants to understand similarities and differences
- (3) developing a theory to explain how atoms combine
- (4) studying the causes of acid rain

63 Reducing energy waste and improving energy efficiency is known as

- (1) ecology
- (2) conservation
- (3) radiation
- (4) pollution

66 For any complex system to function, the parts must

- (1) use only renewable energy resources
- (2) decrease the efficiency of the system
- (3) work together
- (4) be good conductors

64 Because of air pollution and radioactive wastes, many people want to increase the use of

- (1) coal
- (2) oil
- (3) solar energy
- (4) nuclear energy

67 When decisions are made about the use of a new technology, which effects are appropriate to consider?

- (1) all positive effects and only life-threatening negative effects
- (2) only life-saving positive effects and all negative effects
- (3) only life-saving positive effects and life-threatening negative effects
- (4) all positive and negative effects

68 The chart below shows how some technological devices are used.

Technological Device	Function
Insulin pump	provides insulin to diabetics
Dentures	help to chew food
Eyeglasses	help the eyes focus
Pacemaker	regulates uneven heartbeat

The information in the chart best supports the idea that the development of these technological devices has

- (1) resulted in society polluting the environment
- (2) improved society's standard of living
- (3) forced society to use renewable resources
- (4) had no effect on society

69 The cartoon below refers to an environmental concern.



“Congratulations. They've named a lung disease after you.”

Which statement best expresses the cartoon's environmental concern?

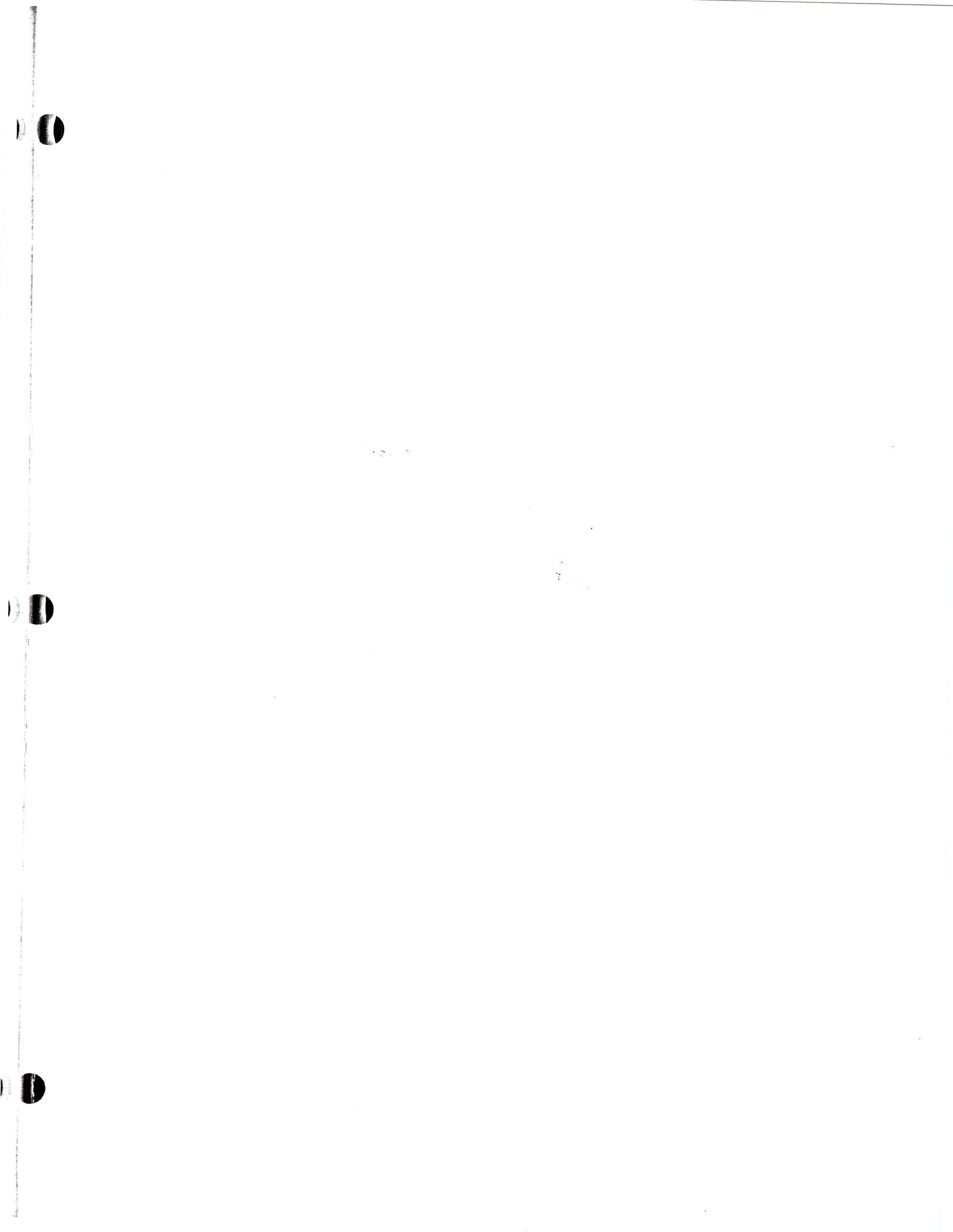
- (1) Plant matter and animal wastes can be burned to produce heat.
- (2) Air pollution is usually radioactive.
- (3) Renewable resources are recycled by natural processes.
- (4) Air pollution can lead to respiratory problems.

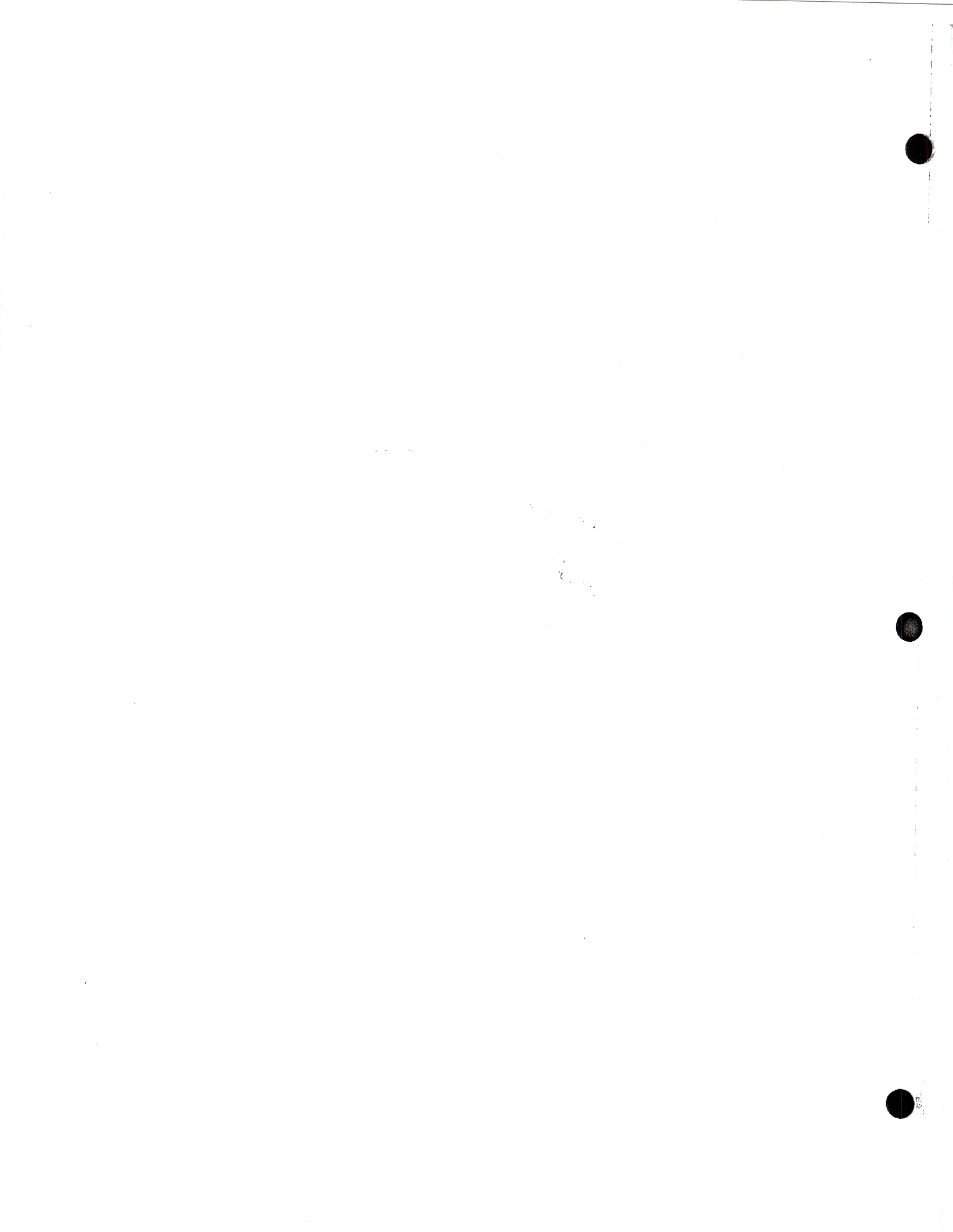
Directions (70): Record your answer to question 70 in the space provided on the last page of this test booklet. Turn to the last page and fold it along the dotted line. Then tear it off slowly and carefully. Write your name and the other information requested in the spaces at the top of the page.

- 70 The data table below shows the average diameters of ripe tomatoes from plants grown with different amounts of fertilizer.

Amount of Fertilizer Each Month (g)	Average Diameter of Tomatoes (cm)
0	7
20	8
40	9
60	10
80	9
100	8

Use the information in the table to construct a graph on the grid shown on the answer sheet. Mark the location of each point with an X and connect the points to show the relationship between the amount of fertilizer used and the average diameter of tomatoes.





Student's Name _____ Grade _____ Date of Birth _____
School Name _____ City _____
Teacher's Name _____ Today's Date _____

Tear Here

REGENTS COMPETENCY TEST

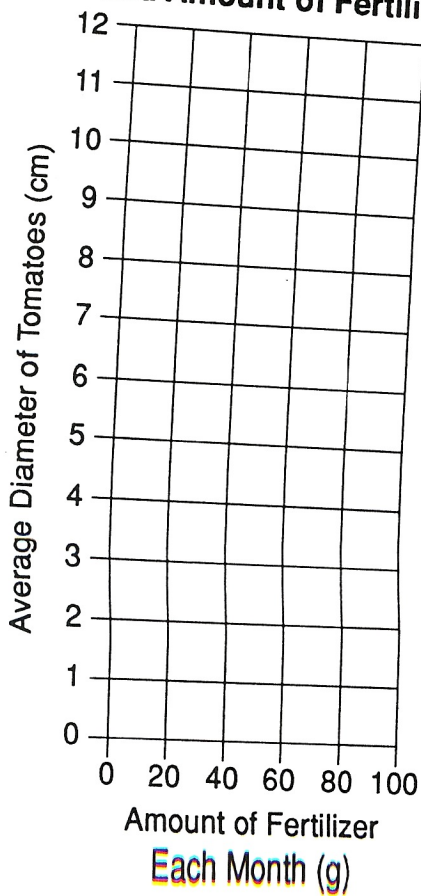
SCIENCE

Thursday, June 22, 1995 – 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.

70

Relationship of Tomato Diameter and Amount of Fertilizer



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