

THE UNIVERSITY OF THE STATE OF NEW YORK

# GRADE 4

## ELEMENTARY-LEVEL SCIENCE TEST

### WRITTEN TEST

MAY 2004

**Student Name** \_\_\_\_\_

**School Name** \_\_\_\_\_

Print your name and the name of your school on the lines above.

The test has two parts. Parts I and II are in this test booklet.

**Part I** contains 30 multiple-choice questions. Record your answers to these questions on the separate answer sheet. Use only a No. 2 pencil on your answer sheet.

**Part II** consists of 11 open-ended questions. Write your answers to Part II in this test booklet.

You will have as much time as you need to answer the questions.

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THE STATE EDUCATION DEPARTMENT  
ALBANY, NEW YORK 12234

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## DIRECTIONS

There are 30 questions on Part I of this test. Each question is followed by three or four choices, labeled A–D. Read each question carefully. Decide which choice is the best answer. 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 letter as the answer you have chosen. Use a No. 2 pencil to mark the answer sheet.

Read Sample Question **S-1** below.

**S-1** Frozen water is called

- A fog
- B ice
- C steam
- D vapor

The correct answer is **ice**, which is next to letter **B**. On your answer sheet, look at the box showing the row of answer circles for Sample Question **S-1**. See how the circle for letter **B** has been filled in.

Now do Sample Question **S-2**. Mark your answer on the answer sheet in the box showing the row of answer circles for Sample Question **S-2**.

**S-2** Which animal has wings?

- A bird
- B frog
- C mouse
- D rabbit

The correct answer is **bird**, which is next to letter **A**. On your answer sheet, you should have filled in circle **A**.

Answer all 30 questions on Part I of this test. Fill in only one circle for each question. Be sure to erase completely any answer you want to change. You may not know the answers to some of the questions, but do the best you can on each one.

When you have finished Part I, go on to Part II. Answer all of the questions in Part II in the space provided for each question.

## Part I

- 1 In New York State, the longest period of daylight occurs during which month?
  - A June
  - B March
  - C December
  - D September
  
- 2 Sleet, rain, snow, and hail are forms of
  - A erosion
  - B evaporation
  - C groundwater
  - D precipitation
  
- 3 Water freezing is an example of a
  - A liquid changing to a solid
  - B solid changing to a liquid
  - C gas changing to a solid
  - D gas changing to a liquid
  
- 4 Which form of energy is needed to change water from a liquid to a gas?
  - A heat
  - B mechanical
  - C chemical
  - D sound
  
- 5 Which type of energy does a person use to pedal a bicycle?
  - A light
  - B sound
  - C mechanical
  - D electrical

6 Which object is the best conductor of electricity?

- A a wax crayon
- B a plastic spoon
- C a rubber eraser
- D an iron nail

Base your answers to questions 7 and 8 on the information below.

One hot, summer day it rained very heavily. After the rain, a plastic pan on a picnic table had 2 cm of rainwater in it. Four hours later, all the rainwater in the pan was gone.

7 Which process caused the rainwater in the pan to disappear as it sat outside in the hot air?

- A condensation
- B evaporation
- C precipitation
- D erosion

**Note that question 8 has only three choices.**

8 If the day were cool instead of hot, the rainwater in the pan would have disappeared

- A slower
- B faster
- C in the same amount of time

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9 Which characteristic can a human offspring inherit?

- A facial scar
- B blue eyes
- C long hair
- D broken leg

- 10** A duck's feathers are covered with a natural oil that keeps the duck dry. This is a special feature ducks have that helps them
- A feed their young
  - B adapt to their environment
  - C attract a mate
  - D search for food
- 11** The functions of a plant's roots are to support the plant and
- A make food
  - B produce fruit
  - C take in water and nutrients
  - D aid in germination
- 12** Which food is a fruit?
- A a potato
  - B an onion
  - C a carrot
  - D a pumpkin
- 13** In which environment would a white rabbit be best protected from predators?
- A a shady forest
  - B a snowy field
  - C a grassy lawn
  - D a muddy riverbank
- 14** Frogs lay eggs that develop into tadpoles and then into adult frogs. This sequence of changes is an example of how living things
- A go through a life cycle
  - B form a food web
  - C act as a source of food
  - D affect other parts of the ecosystem

**15** A mother hen clucks loudly when danger is near and her chicks quickly gather around her. Which sense helps the chicks receive this warning about danger from their mother?

- A smell
- B taste
- C sight
- D sound

**16** The sunrise and sunset times for three days in February are recorded in the chart below.

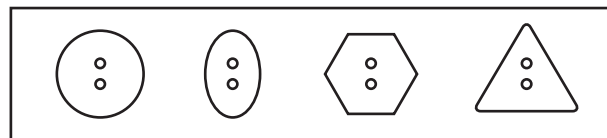
Date	Sunrise	Sunset
February 8	7:00 a.m.	5:20 p.m.
February 15	6:50 a.m.	5:30 p.m.
February 22	6:40 a.m.	5:40 p.m.

Source: [www.sunrisesunset.com](http://www.sunrisesunset.com)

Which statement is an accurate conclusion based on this information?

- A There are more hours of daylight as the month goes by.
- B There are fewer hours of daylight as the month goes by.
- C The Sun rises later as the month goes by.
- D The Sun sets earlier as the month goes by.

**17** A group of buttons is shown in the diagram below.



Which button belongs with the group of buttons shown?



A



B

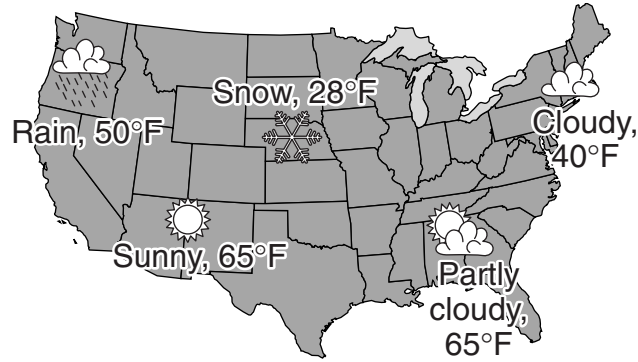


C



D

18 Which information is contained on this map of the United States?



- A state capitals
- B mountain ranges
- C weather conditions
- D animal populations

19 Temperatures below freezing are expected overnight. What might be done to protect plants growing outside?

- A trim the leaves
- B weed them
- C cover them
- D give them plant food

20 A student reaches one hand into a bag filled with smooth objects. The student feels the objects but does not look into the bag. Which property of the objects can the student most likely identify?

- A shape
- B color
- C ability to reflect light
- D ability to conduct electricity

21 A student has a ball of clay that sinks when placed in a pan of water. Which property should he change to make the clay float?

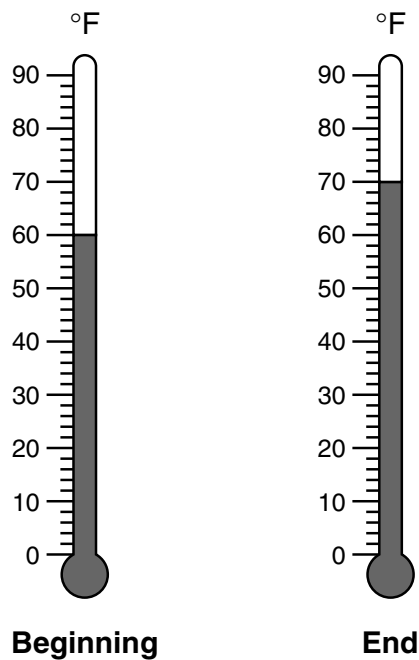
- A color
- B texture
- C mass
- D shape



**22** A girl signals her friend by shining a flashlight on a mirror. Her friend can see the signal because

- A heat energy can be transferred from one object to another
- B mechanical energy can be transferred from one object to another
- C sound energy can be reflected from one object to another
- D light energy can be reflected from one object to another

**23** The thermometers below show the temperature of a liquid at the beginning and at the end of an experiment.



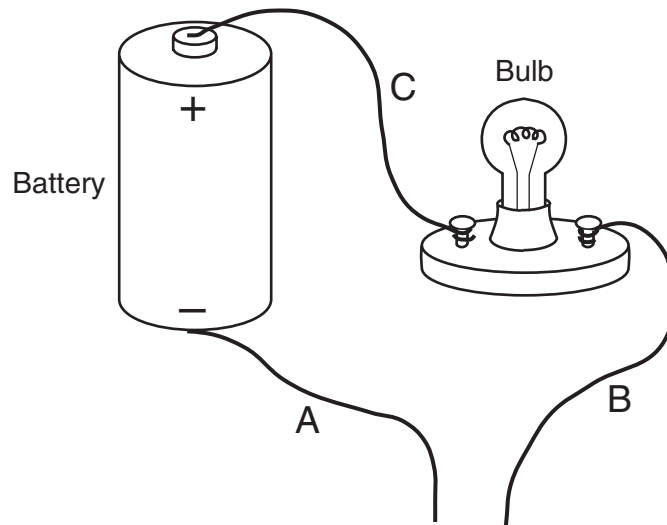
How did the temperature of the liquid change from the beginning to the end of the experiment?

- A It went down 4°F.
- B It went down 8°F.
- C It went up 2°F.
- D It went up 10°F.

**24** Which part of a plant produces the seeds?

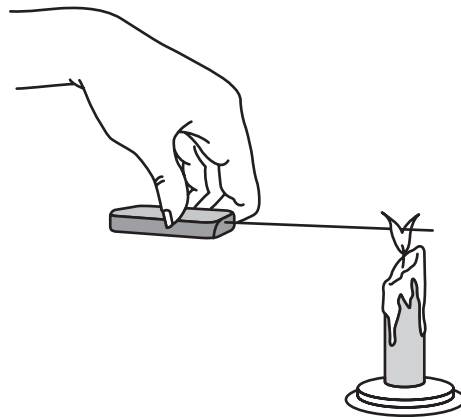
- A flower
- B leaves
- C stem
- D roots

- 25 The diagram below shows an incomplete electrical circuit that includes a battery, a bulb, and three wires labeled A, B, and C.



The bulb is **not** lit. What should be done in order to light the bulb and complete the circuit?

- A Remove wire C.
  - B Remove the battery.
  - C Connect wires B and C.
  - D Connect wires A and B.
- 26 The drawing below shows a copper wire with a wooden handle being held in a flame.



After a few minutes, what will most likely happen?

- A The light will change to electricity.
- B The heat will travel through the wire.
- C The flame will get brighter.
- D The flame will go out.

**27** Fourth graders are planning a roller-skate race. Which surface would be the best for this race?

- A gravel
- B sand
- C blacktop
- D grass

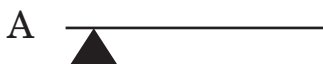
**28** Which instrument would be best to measure the volume of a liquid?

- A a pan balance
- B a stopwatch
- C a thermometer
- D a graduated cylinder

**29** What is one way that humans can maintain good health?

- A sleep all day
- B exercise daily
- C eat snacks often
- D stay up late

**30** Two objects of the same mass are going to be placed the same distance from the support of a balance beam. Which diagram shows where the support should be placed under the beam so the objects will balance?



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## Part II

*Directions* (31–41): Record your answers in the space provided below each question.

Base your answers to questions 31 and 32 on the information and chart below and on your knowledge of science.

Nutrients from food help the body grow and repair itself. Calcium is needed to grow strong bones and teeth. Calcium is found in many different foods. The chart below shows the percentage of calcium per serving in some foods.

Food	Percentage of Calcium Per Serving*
Milk	30
Orange juice	2
Yogurt	30
Cheese	10
Baked beans	6

\*Percent Daily Values are based on a 2,000-calorie diet.

**31** Which food from the chart has the *lowest* percentage of calcium per serving? [1]

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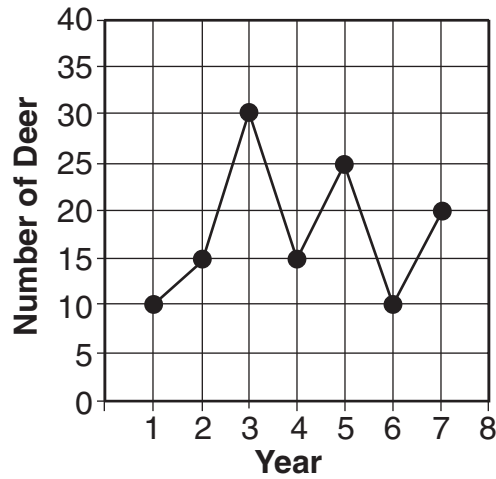
**32** What is one reason to include calcium in a healthy diet? [1]

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Base your answers to questions 33 and 34 on the graph below and on your knowledge of science. The graph shows a deer population in an area over a period of seven years.



**33** How many times was there a *decrease* in the deer population from one year to the next over the seven-year period? [1]

\_\_\_\_\_ times

**34** Describe **two** factors that might have caused a *decrease* in the deer population. [2]

(1) \_\_\_\_\_

\_\_\_\_\_

(2) \_\_\_\_\_

\_\_\_\_\_

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**35 a** Some birds fly south in the fall. This seasonal adaptation is known as migration. Explain why these birds migrate. [1]

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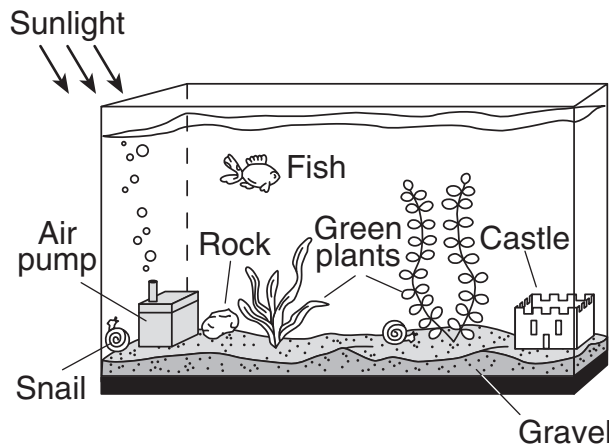
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**b** Give an example of **another** way that animals adapt to seasonal changes. [1]

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Base your answers to questions 36 and 37 on the diagram of a fish tank below and on your knowledge of science.



**36** Identify **two** living organisms in the diagram. [1]

(1) \_\_\_\_\_

(2) \_\_\_\_\_

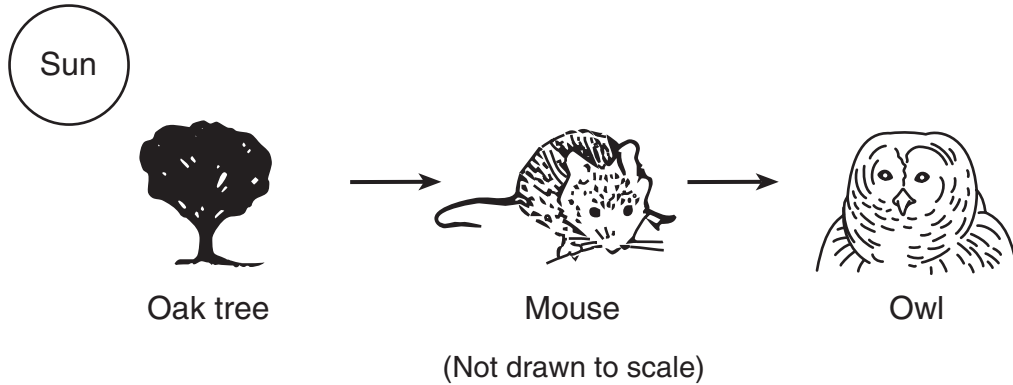
**37** Identify **two nonliving** objects in the diagram. [1]

(1) \_\_\_\_\_

(2) \_\_\_\_\_

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Base your answers to questions 38 through 40 on the food chain below and on your knowledge of science.



38 Which organism in this food chain uses the Sun’s energy to produce food? [1]

\_\_\_\_\_

39 Which organism in this food chain depends directly on plants for food? [1]

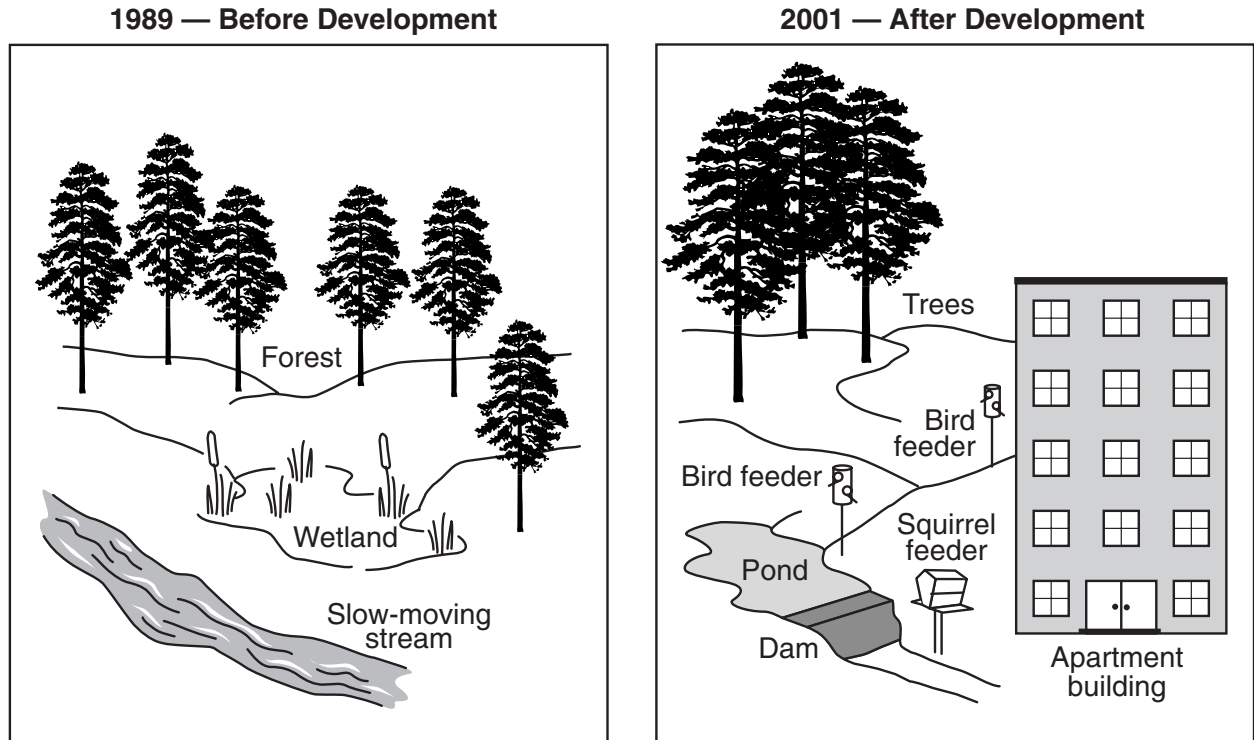
\_\_\_\_\_

40 If a mouse dies and is **not** eaten by an owl, how do the nutrients from the mouse go back into the food chain? [1]

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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41 A company bought land in 1989 to build apartments. The diagram labeled 1989 shows the land before the company built the apartments. The diagram labeled 2001 shows the same land after the company built the apartments.



**a** Describe one **positive** way that the organisms living in the area have been affected by the changes shown in the diagrams. [1]

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**b** Describe one **negative** way that the organisms living in the area have been affected by the changes shown in the diagrams. [1]

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**For Teacher Use Only**  
**Part II Credit**

<b>Question</b>	<b>Maximum Credit</b>	<b>Credit Allowed</b>
<b>31</b>	<b>1</b>	
<b>32</b>	<b>1</b>	
<b>33</b>	<b>1</b>	
<b>34</b>	<b>2</b>	
<b>35</b>	<b>2</b>	
<b>36</b>	<b>1</b>	
<b>37</b>	<b>1</b>	
<b>38</b>	<b>1</b>	
<b>39</b>	<b>1</b>	
<b>40</b>	<b>1</b>	
<b>41</b>	<b>2</b>	
<b>Total</b>	<b>14</b>	