

THE UNIVERSITY OF THE STATE OF NEW YORK

# GRADE 4

## ELEMENTARY-LEVEL SCIENCE TEST

### WRITTEN TEST

JUNE 4, 2012

**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 12 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.

**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.**

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THE UNIVERSITY OF THE STATE OF NEW YORK  
THE STATE EDUCATION DEPARTMENT  
ALBANY, NEW YORK 12234

## 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 for each question.

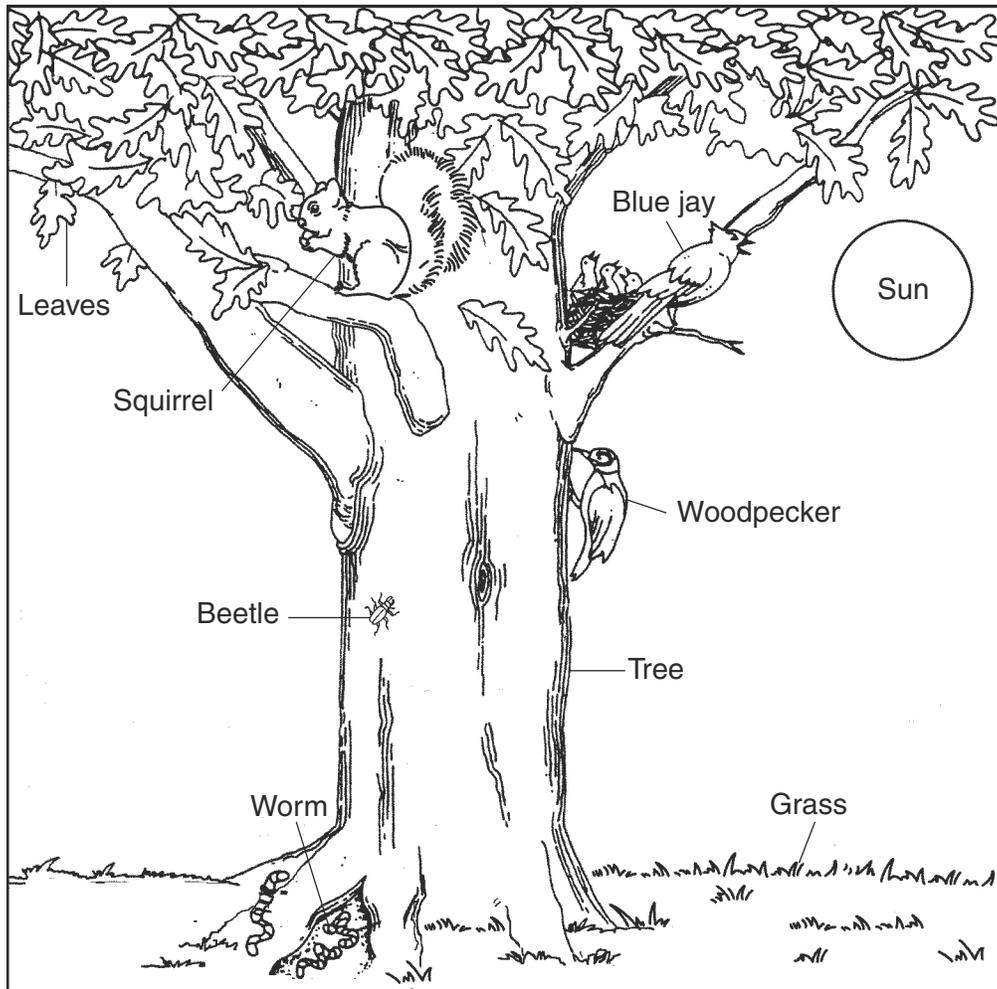
## Part I

- 1 Which object has the greatest flexibility?
  - A wooden block
  - B paper cup
  - C metal nail
  - D glass bottle
  
- 2 A definite shape and a definite volume are properties of which state of matter?
  - A solid, only
  - B liquid, only
  - C solid and liquid
  - D liquid and gas
  
- 3 Which Earth movement results in day and night?
  - A erosion
  - B deposition
  - C revolution
  - D rotation
  
- 4 Which tool should a student use to see the patterns on a small object?
  - A balance
  - B hand lens
  - C thermometer
  - D graduated cylinder
  
- 5 Which terms are both used to describe the weather?
  - A gravity and wind direction
  - B precipitation and runoff
  - C groundwater and erosion
  - D air temperature and wind speed

- 6** Which metric units should be used to describe the mass of an object?
- A centimeters
  - B liters
  - C grams
  - D degrees Celsius
- 7** When a cup of water at room temperature is put in a freezer, the water's state of matter will change from
- A liquid to gas
  - B gas to liquid
  - C liquid to solid
  - D solid to liquid
- 8** Which form of energy is produced when paper is burned?
- A heat
  - B magnetic
  - C electrical
  - D chemical
- 9** Gravity and magnetism are both
- A common forces
  - B natural cycles
  - C states of matter
  - D forms of energy
- 10** At approximately which time of day is the Sun at the highest point in the sky to an observer in New York State?
- A 6 a.m.
  - B noon
  - C 6 p.m.
  - D midnight

- 11 Which property of an object describes how easily electricity travels through it?
- A color
  - B temperature
  - C reflectivity
  - D conductivity
- 12 During which process are pieces of rock material being moved over Earth's surface by water and wind?
- A conduction
  - B deposition
  - C erosion
  - D revolution
- 13 Which factor will cause a *decrease* in the force of attraction between two magnets?
- A increasing the size of the two magnets
  - B increasing the distance between the two magnets
  - C changing the color of the two magnets
  - D changing the texture of the two magnets
- 14 In order to maintain good health, humans should
- A eat foods high in fat
  - B exercise regularly
  - C drink alcohol often
  - D smoke tobacco occasionally

Base your answers to questions 15 and 16 on the diagram below and on your knowledge of science. The diagram shows some organisms living together.



(Not drawn to scale)

**15** The baby birds in the nest are competing for

- A food
- B mates
- C predators
- D camouflage

**16** Which two organisms in this diagram are producers?

- A blue jay and woodpecker
- B beetle and squirrel
- C worm and leaves
- D tree and grass

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**17** Which characteristic helps some animals defend themselves against predators?

- A strong odor
- B poor hearing
- C weak eyesight
- D shivering

**18** The main function of a fish's fins is to help the fish

- A reproduce
- B see
- C breathe
- D move

**19** When ocean waters become too warm, some whales travel to colder water. This movement is an example of

- A nest building
- B hunting
- C migrating
- D hibernating

**20** Green plants get the energy they need to make food from

- A water
- B air
- C soil
- D sunlight

**21** Which three things do animals need from their environment in order to survive?

- A soil, water, and food
- B soil, light, and water
- C air, food, and water
- D air, water, and light

**22** Which two processes are common to all living things?

- A flying and breathing
- B migrating and reproducing
- C using nutrients and growing
- D eliminating waste and hibernating

**23** Trees start as seeds and grow into mature trees that produce more seeds. This pattern represents a

- A food chain
- B life cycle
- C food supply
- D life span

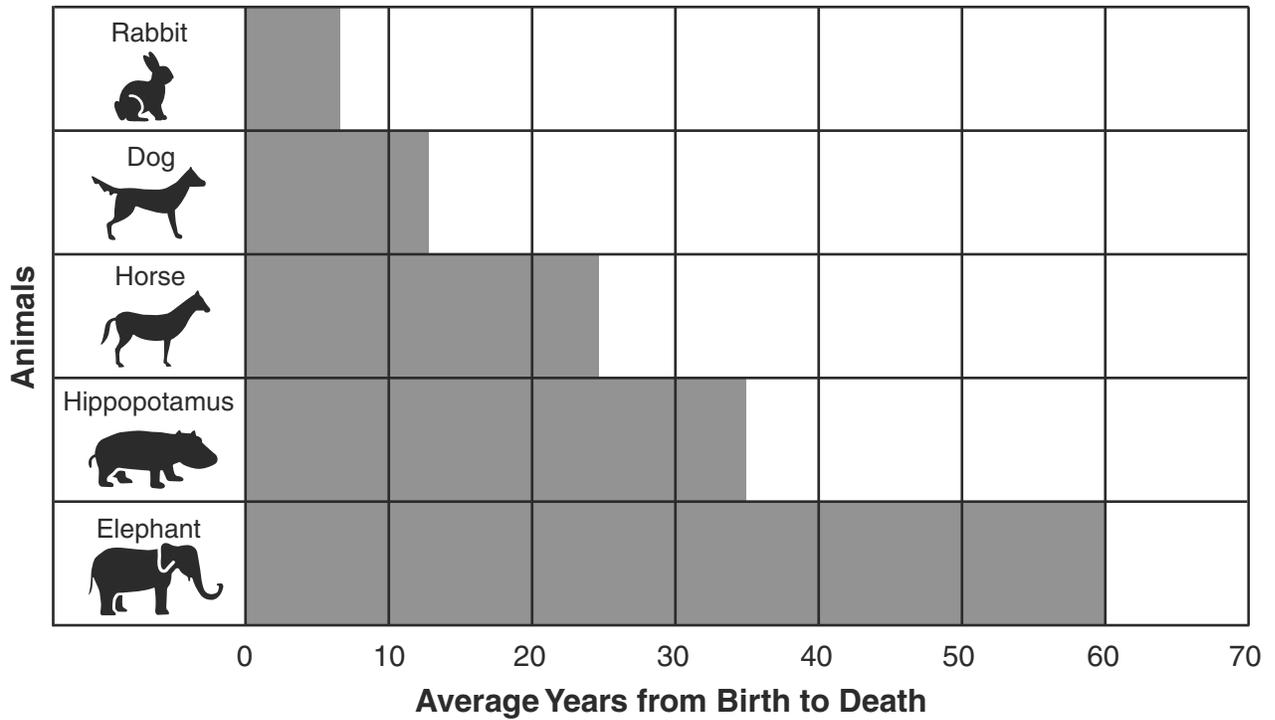
**24** The photograph below shows a cactus plant covered with sharp spines.



How do the sharp spines on the cactus help it to survive?

- A They absorb sunlight.
- B They provide support for the plant.
- C They keep animals away from the plant.
- D They carry food to the flower.

25 The graph below shows information about several animals.



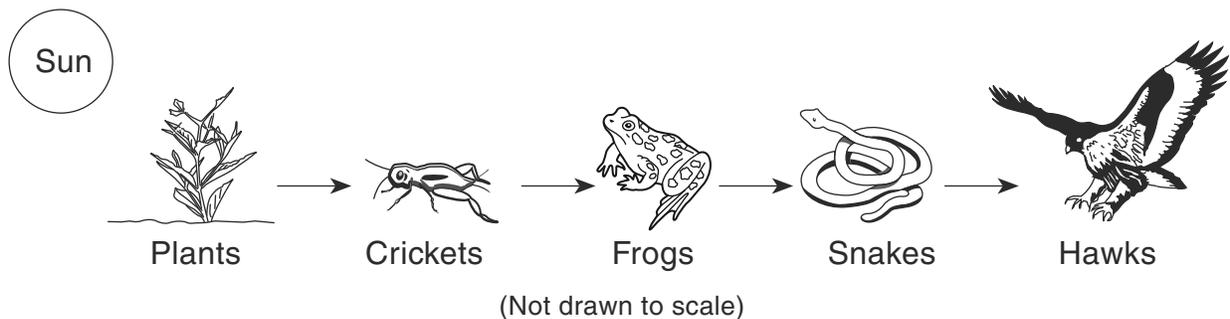
What is the best title for this graph?

- A Life Cycles of Some Animals
- B Life Spans of Some Animals
- C Life Processes of Some Animals
- D Life Functions of Some Animals

26 Which is an example of a *nonliving* thing?

- A bird
- B insect
- C dog
- D water

Base your answers to questions 27 and 28 on the food chain below and on your knowledge of science



**27** If the number of frogs decreases, which population will most likely increase?

- A crickets
- B hawks
- C snakes
- D plants

**28** Two predators shown in the diagram are

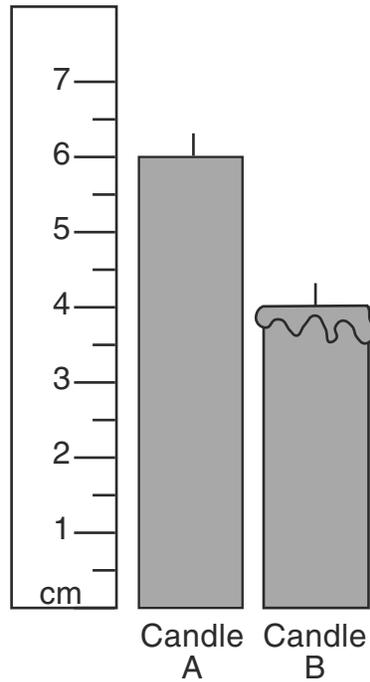
- A hawks and snakes
- B hawks and plants
- C frogs and crickets
- D frogs and plants

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**29** Three identical seeds are planted and grown in identical pots of soil. All three pots receive equal amounts of sunlight. The plants are watered once each day. Plant *A* is given 10 milliliters (mL) of water. Plant *B* is given 20 mL of water. Plant *C* is given 30 mL of water. The height of each plant is measured and recorded after ten days. Which question could be answered by this experiment?

- A How much space does a plant need to grow?
- B How much soil does a plant need to grow?
- C How much water will make a plant grow tallest?
- D How much sunlight will make a plant grow tallest?

**30** Two candles, *A* and *B*, were the same size. Candle *B* was lit and burned for an hour. After the hour, the candles were measured, as shown in the diagram below.



How many centimeters shorter is candle *B* after it burned for an hour?

- A 2 cm
- B 3 cm
- C 4 cm
- D 5 cm

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## Part II

*Directions* (31–42): Record your answers in the space provided below each question.

- 31** A student tested the five objects shown below to see if they would float or sink when placed in water. The nail, keys, and egg sank. The ball and apple floated.



(Not drawn to scale)

Complete the data table below to show the results of the student's test. Use an **X** to show if each object floated or sank. [1]

**Data Table**

Object	Floated	Sank
apple		
ball		
egg		
keys		
nail		

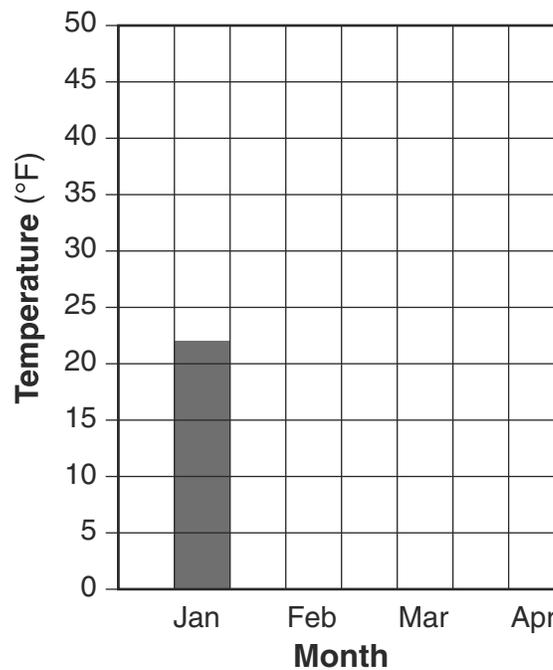
**32** The data table below shows the average monthly temperature for Albany, New York, for the first four months of the year.

**Average Monthly Temperature for Albany, New York**

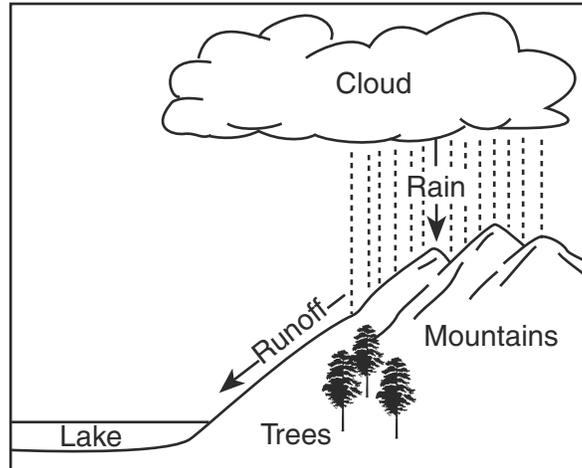
Month	Temperature (°F)
January	22
February	25
March	35
April	47

Use the data in the table to complete the bar graph below. The average temperature for January is shown. [1]

**Average Monthly Temperature for Albany, New York**



**33** The diagram below shows runoff occurring during a rainstorm.



After a heavy rain, the amount of runoff increases. Explain **one** way the increased runoff could affect the environment. [1]

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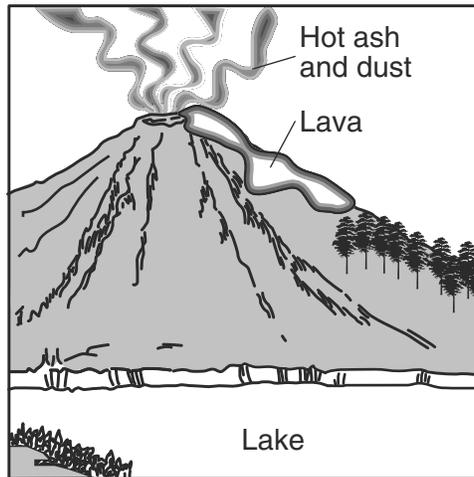
**34** A puddle formed on a sidewalk when it rained during a night. By noon the next day, some of the liquid water in the puddle had evaporated. Explain what may have happened to cause the water to evaporate. [1]

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**35** The diagram below shows a volcanic eruption. When volcanoes erupt, they can release large amounts of hot liquid rock (lava) and clouds of hot ash and dust.



Describe **one *negative*** effect that a volcanic eruption has on the environment of animals living in the area. [1]

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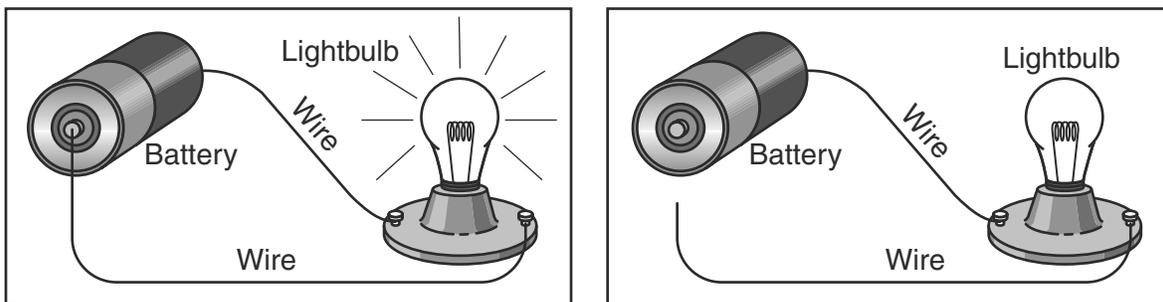
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**36** Objects have properties that can be observed using the five senses. The chart below shows some observations made with the senses. Complete the chart by identifying the sense used to make each observation. The sense used to observe red color is shown. [2]

Observation Made	Sense
red color	sight
salty flavor	
strong odor	
smooth surface	
loud noise	

**37** The diagrams below show two circuits, A and B. The lightbulb in circuit A is lit. The lightbulb in circuit B is *not* lit.



**A**

(Not drawn to scale)

**B**

Explain why the lightbulb is lit in circuit A. [1]

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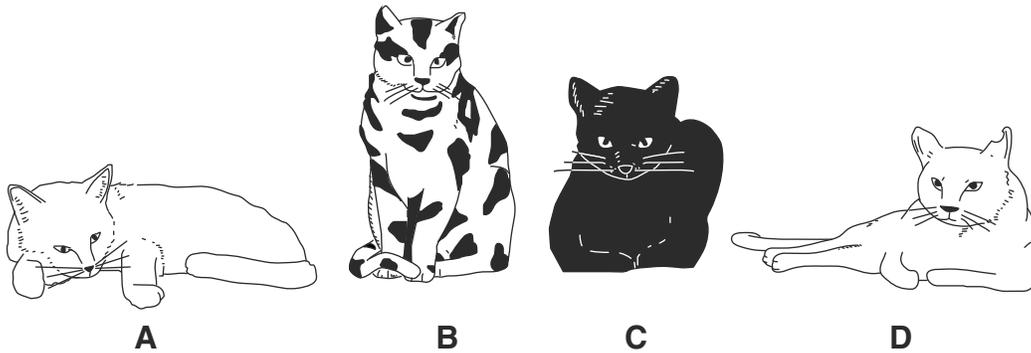


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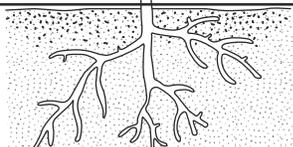
**38** The diagram below shows four kittens labeled *A*, *B*, *C*, and *D*. The kittens have the same parents.



Complete the chart below by placing an **X** in the correct column to show whether the example describes an inherited trait, a learned trait, or an acquired trait. [2]

Example	Inherited Trait	Learned Trait	Acquired Trait
Kitten A has long whiskers.			
Kitten B has black spots.			
Kitten C goes to its food bowl when it hears the food being opened.			
Kitten D has lost part of its ear in a fight.			

**39** The chart below shows a diagram of a plant divided into four parts. Each part is a different plant structure that serves a different function. Some of the structures and functions are shown. Complete the blank spaces in the chart by identifying the plant structure shown in the diagram or describing **one** function of that plant structure. [2]

Diagram	Plant Structure	Function of Plant Structure
		produces fruit with seeds to make new plants
	leaves	
		provides support for the plant
	roots	

**40** Humans respond to changes in their environment in many different ways. Complete the chart below by describing a human response to the environmental change listed. The first environmental change and human response are shown. [1]

**Human Responses to Environmental Changes**

Environmental Change	Human Response
strong wind	eyes water
sudden loud sound	

41 The diagrams below show a woodland habitat in winter and in summer.



Winter



Summer

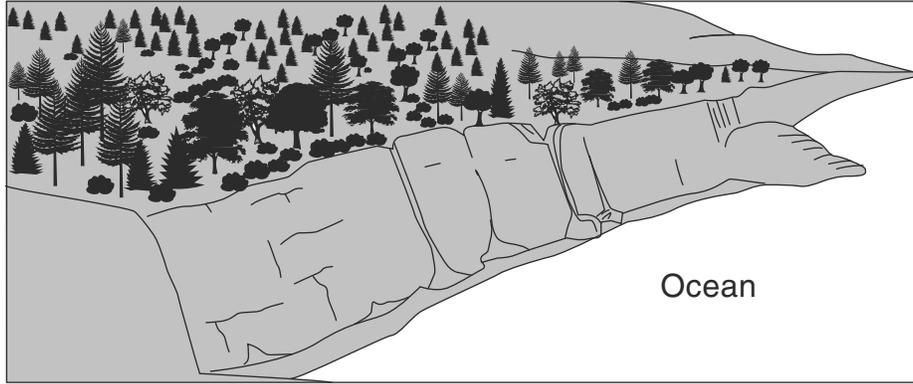
During which season would a white rabbit be best protected from predators?  
Explain your answer. [1]

Season: \_\_\_\_\_

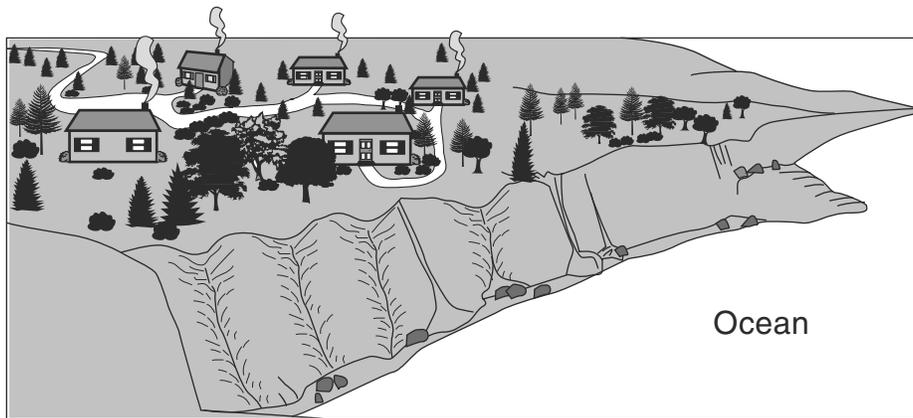
Explanation: \_\_\_\_\_

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

42 The diagrams below show an oceanside environment before and after houses were built in the area.



Before Development



After Development

State **one negative** effect that building the houses may have had on this oceanside environment. [1]

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# GRADE 4 ELEMENTARY-LEVEL SCIENCE

## 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>1</b>	
<b>35</b>	<b>1</b>	
<b>36</b>	<b>2</b>	
<b>37</b>	<b>1</b>	
<b>38</b>	<b>2</b>	
<b>39</b>	<b>2</b>	
<b>40</b>	<b>1</b>	
<b>41</b>	<b>1</b>	
<b>42</b>	<b>1</b>	
<b>Total</b>	<b>15</b>	