

THE UNIVERSITY OF THE STATE OF NEW YORK

# GRADE 4

## ELEMENTARY-LEVEL SCIENCE TEST

### WRITTEN TEST

SPRING 2009

**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 10 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 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.

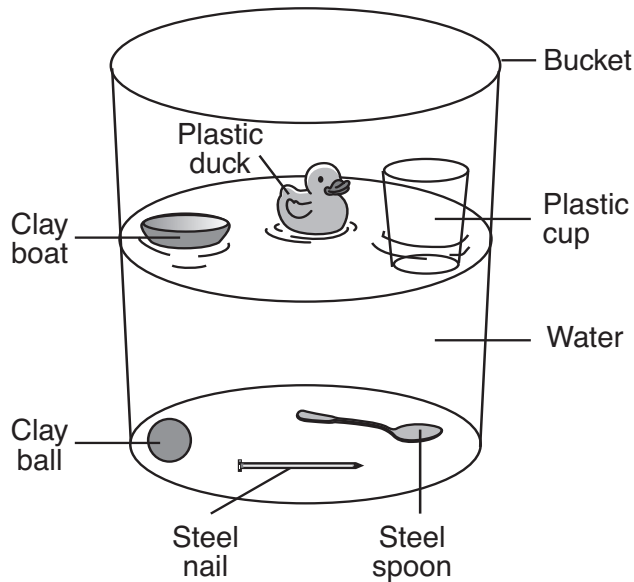
When you have finished Part I, go on to Part II. Answer all of the questions in Part II in the space for each question.

## Part I

- 1 Windy, cloudy, rainy, and cold are words that help describe
  - A evaporation
  - B deposition
  - C matter
  - D weather
  
- 2 Which sense can be used to determine an object's ability to reflect light?
  - A sight
  - B hearing
  - C smell
  - D taste
  
- 3 A student drops a ball. Which force causes the ball to fall to the ground?
  - A electricity
  - B friction
  - C gravity
  - D magnetism
  
- 4 When an ice cube melts, its state of matter changes from a
  - A gas to a liquid
  - B solid to a liquid
  - C liquid to a solid
  - D solid to a gas
  
- 5 Which unit can be used to describe an object's length?
  - A grams
  - B minutes
  - C liters
  - D meters

Base your answers to questions 6 and 7 on the information below and on your knowledge of science.

A group of students completed a float or sink experiment. They put six objects into a bucket of water. The objects were made of three different materials: clay, plastic, and steel. The diagram below shows the results of the experiment.



**Note that question 6 has only three choices.**

**6** Which material always sank in this experiment?

- A clay
- B plastic
- C steel

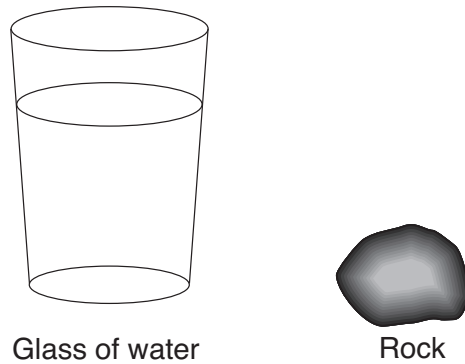
**7** The clay boat and clay ball have the same mass. Which property causes the boat to float and the ball to sink?

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

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

**8** The diagram below shows a glass of water and a rock.



When the rock is placed into the glass, the water level will

- A decrease
- B increase
- C remain the same

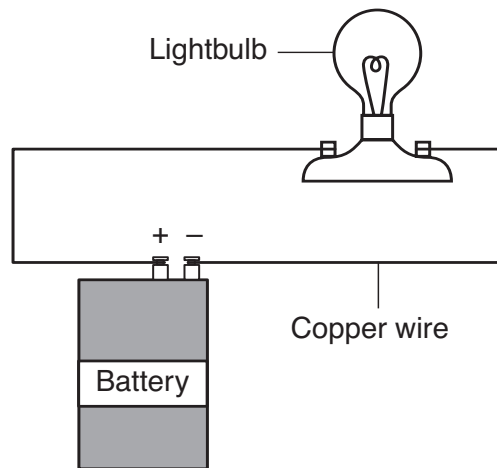
**9** How long does it take for Earth to rotate on its axis seven times?

- A one day
- B one week
- C one month
- D one year

**10** What form of energy is being used when a person pushes a wooden block across the floor?

- A mechanical
- B magnetic
- C sound
- D electrical

11 The diagram below shows an electrical circuit.



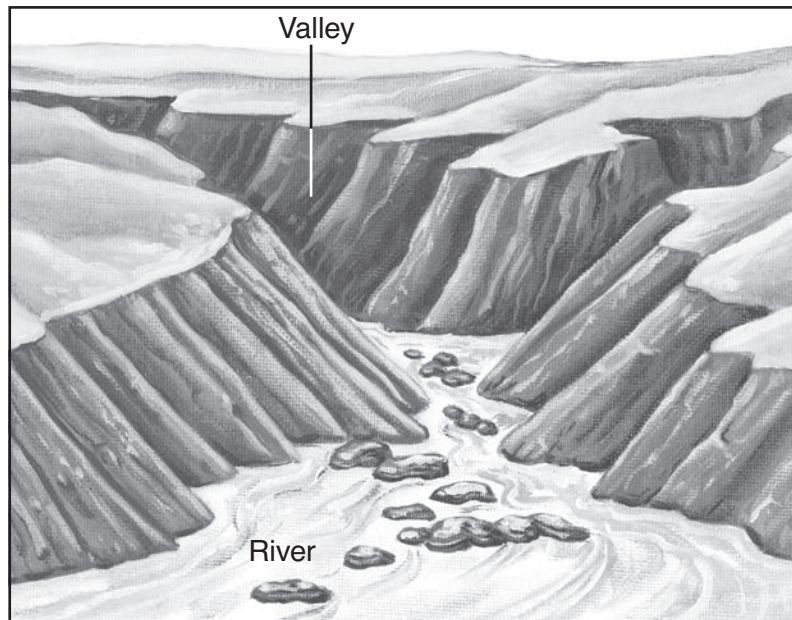
The purpose of the copper wire is to

- A conduct electricity
- B produce electricity
- C store electricity
- D stop the flow of electricity

**Note that question 12 has only three choices.**

- 12 A student measured the volume of water in a pan. The student boiled the water for thirty minutes and then measured the volume of the water again. The volume of water most likely
- A decreased
  - B increased
  - C remained the same

- 13** The diagram below shows the effect of a river on an area over many years.

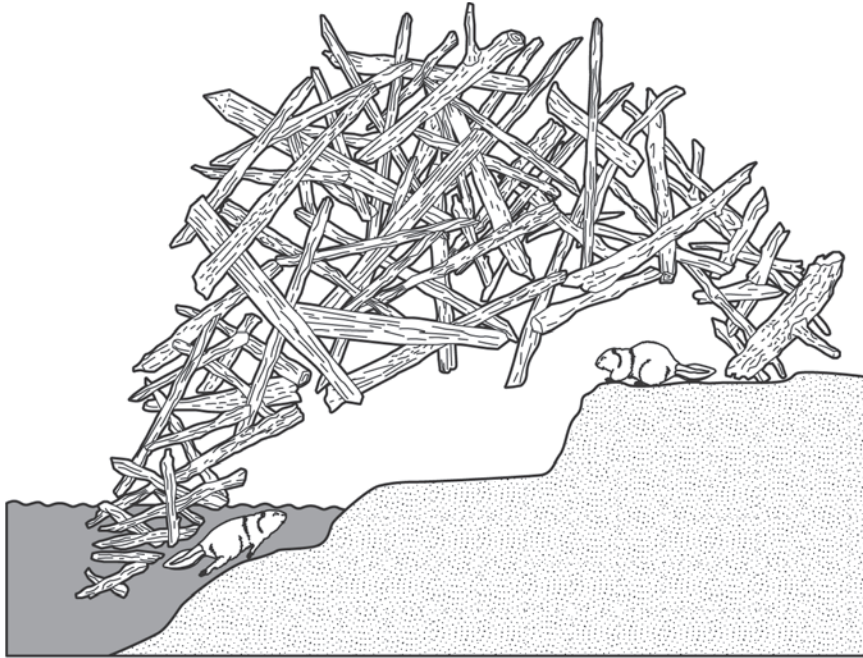


Which process caused the valley to form?

- A condensation
  - B deposition
  - C erosion
  - D evaporation
- 14** Which physical structure would best help a bear to survive a winter in New York State?
- A big ears
  - B black nose
  - C thick fur
  - D brown eyes
- 15** What do all animals need in order to survive?
- A rocks, water, and soil
  - B water, air, and food
  - C air, rocks, and sunlight
  - D food, soil, and sunlight



**16** The diagram below shows a lodge where beavers live.



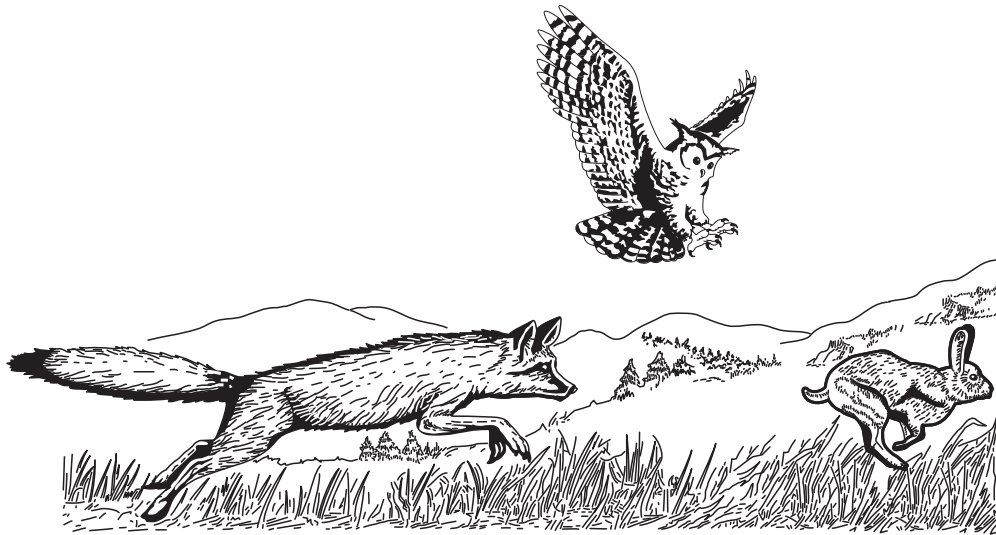
This diagram shows that beavers need trees for

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

**17** During winter, the white fur of an arctic fox blends in with the snow. This adaptation is called

- A hibernation
- B migration
- C camouflage
- D movement

18 The diagram below shows a fox and an owl both trying to catch a rabbit.



(Not drawn to scale)

The fox and the owl are both

- A finding a mate
- B competing for food
- C seeking shelter
- D migrating for winter

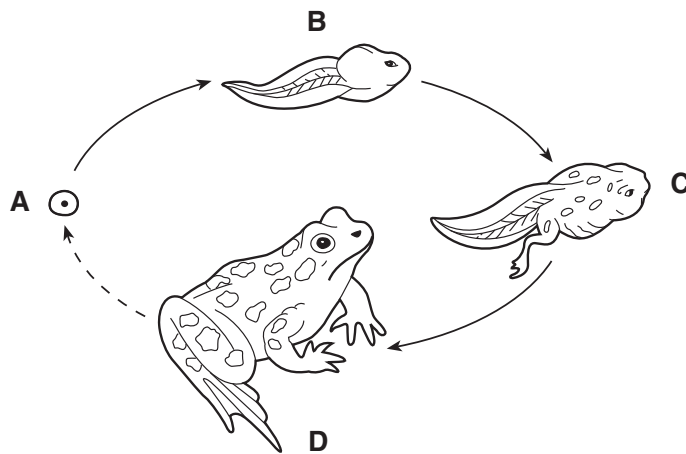
19 Since green plants make their own food, they are called

- A predators
- B prey
- C decomposers
- D producers

20 Which structure of a bird is correctly paired with its function?

- A claws for obtaining food
- B wings for eliminating waste
- C feathers for breathing
- D eyes for growing

- 21** The diagram below shows the life cycle of a frog. Four stages of development are labeled *A*, *B*, *C*, and *D*.



(Not drawn to scale)

Which letter shows the adult stage of development?

- A *A*
- B *B*
- C *C*
- D *D*

- 22** Humans depend on which natural resource from the environment?

- A water
- B houses
- C electricity
- D roads

- 23** Which characteristic can a puppy inherit from its parents?

- A muddy paws
- B spotted fur
- C broken foot
- D scar on face

- 24** Many birds fly south for the winter. This adaptation is called
- A hibernation
  - B germination
  - C migration
  - D communication
- 25** Green plants get the energy they need to make food from
- A air
  - B sunlight
  - C water
  - D soil
- 26** When plants and animals die, which organisms help return nutrients to the food chain?
- A decomposers
  - B predators
  - C prey
  - D producers
- 27** Some butterflies live an average of two weeks. This period of time is called a life
- A process
  - B span
  - C change
  - D cycle
- 28** During an experiment, a student reports that a liquid turned green when mixed with another liquid. This is an example of
- A a measurement
  - B a prediction
  - C an explanation
  - D an observation

29 The data table below shows the height of a bean plant over a three-month period. The height of the plant is recorded in centimeters (cm).

**Height of a Bean Plant**

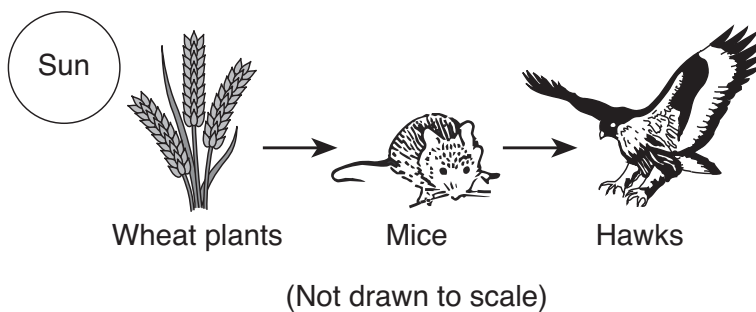
| Month | Height |
|-------|--------|
| March | 4 cm   |
| April | 9 cm   |
| May   | 14 cm  |

If the pattern shown continues, the height of the plant in June will be

- A 6 cm
- B 12 cm
- C 14 cm
- D 19 cm

**Note that question 30 has only three choices.**

30 The diagram below shows a food chain.



If the wheat plants died, the population of mice would most likely

- A decrease
- B increase
- C remain the same

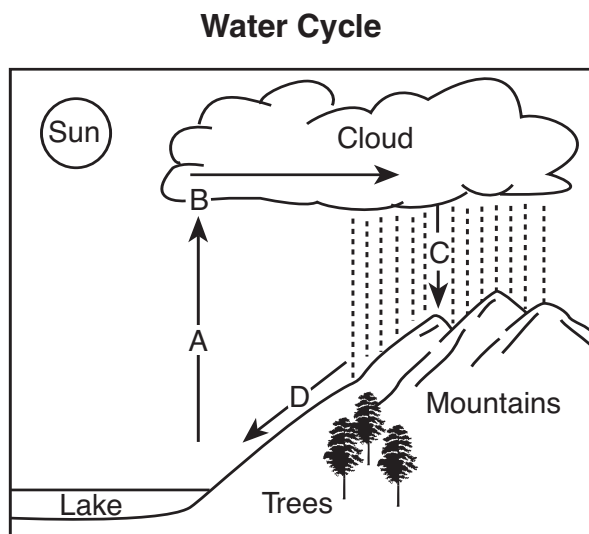
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**GO RIGHT ON TO PART II ⇒**

## Part II

*Directions (31–40):* Record your answers in the space provided below each question.

- 31** The diagram below shows the water cycle. Four stages are labeled A, B, C, and D.



In the chart below, write the letter that represents each stage of the water cycle shown. [2]

| Stage         | Letter |
|---------------|--------|
| condensation  |        |
| evaporation   |        |
| precipitation |        |
| runoff        |        |

Base your answers to questions 32 through 34 on the data table below and on your knowledge of science. The data table shows four properties of five different objects. The properties are labeled *A*, *B*, *C*, and *D*. Properties *A* and *B* are identified.

**Data Table**

| Object | Property             |                       |                |                |
|--------|----------------------|-----------------------|----------------|----------------|
|        | <b>A</b> <u>Mass</u> | <b>B</b> <u>Color</u> | <b>C</b> _____ | <b>D</b> _____ |
| 1      | 25 grams             | red                   | smooth         | sphere         |
| 2      | 35 grams             | yellow                | rough          | cylinder       |
| 3      | 30 grams             | green                 | smooth         | cube           |
| 4      | 25 grams             | red                   | rough          | sphere         |
| 5      | 30 grams             | blue                  | smooth         | cube           |

**32** Identify property *C*. [1] \_\_\_\_\_

**33** Identify property *D*. [1] \_\_\_\_\_

**34** Which **two** objects are both smooth cubes? [1]

Object number: \_\_\_\_\_

Object number: \_\_\_\_\_

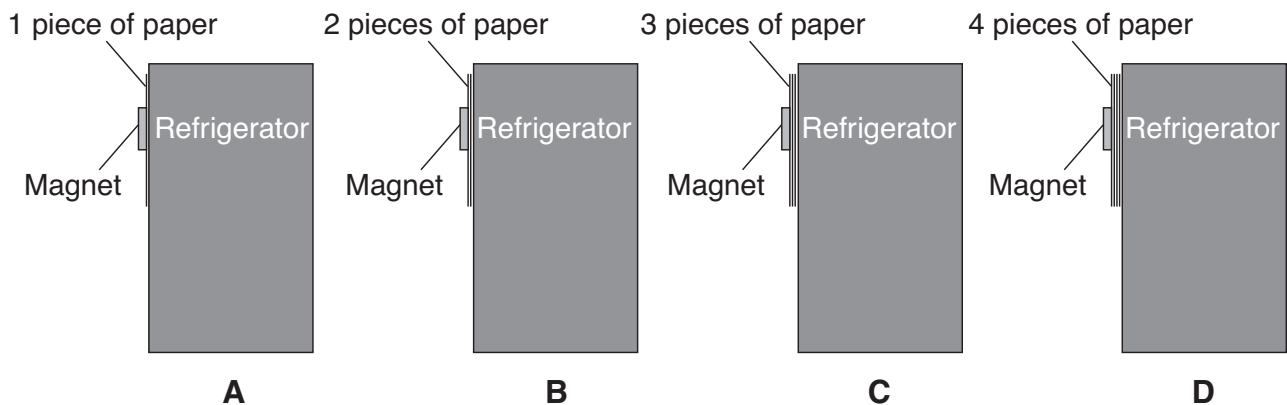
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**35** Complete the chart below by identifying the scientific tool used to measure each of the physical properties listed. The scientific tool in the first row is shown. [2]

**Some Properties Measured by Tools**

| Property           | Scientific Tool |
|--------------------|-----------------|
| mass               | pan balance     |
| volume of a liquid |                 |
| temperature        |                 |

**36** The diagrams below show identical magnets holding pieces of paper on a refrigerator. [1]



Explain why adding more paper to the refrigerator in diagram *D* might cause the magnet to fall off. [1]

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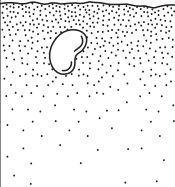
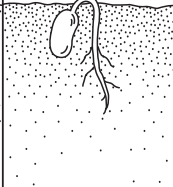
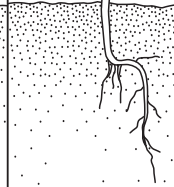
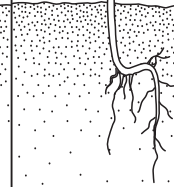


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37 The diagram below shows the growth and development of a bean seed into a plant.

**Growth and Development of a Bean Seed into a Plant**

| Stage                    | A   | B   | C  | D   |
|--------------------------|---|---|--|---|
| Length (cm)              | 0.6 cm  | 2.0 cm  | 7.0 cm   | 11.0 cm   |
| Appearance of Seed/Plant |  |  |  |  |

(Not drawn to scale)

How much has the bean plant grown from stage *B* to stage *D*? [1]

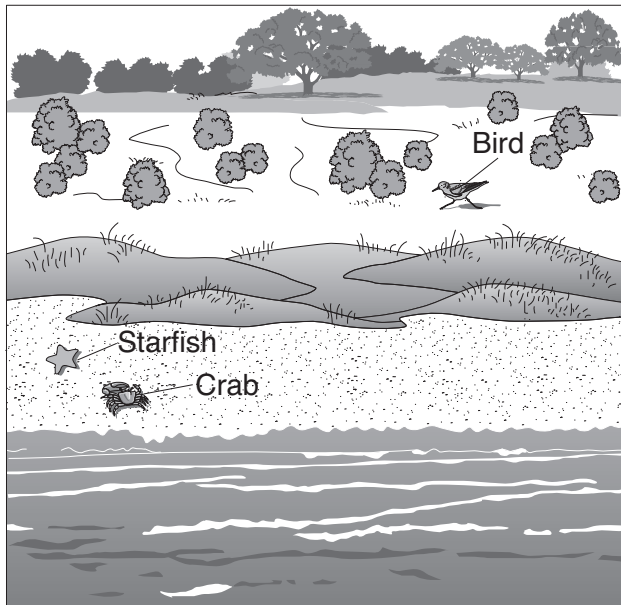
\_\_\_\_\_ cm

38 Complete the chart below by describing **one** way that some trees respond to each change in season listed. [2]

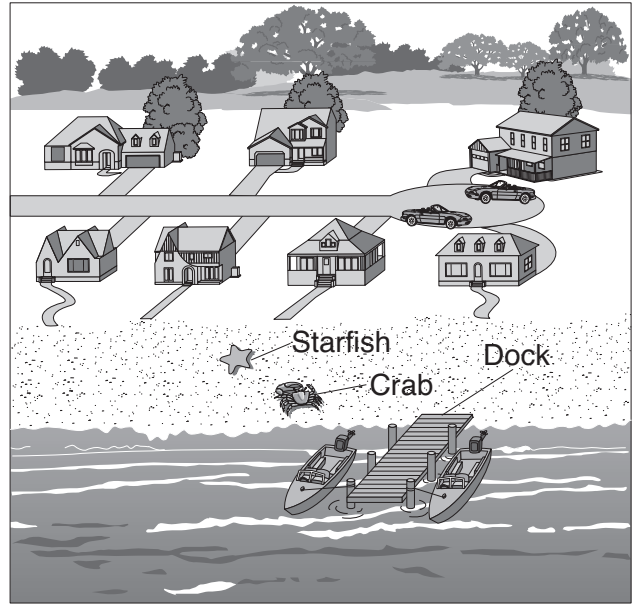
**Ways that Some Trees Respond to Changes in Season**

| Change in Season          | Way that Some Trees Respond |
|---------------------------|-----------------------------|
| summer changing to fall   |                             |
| winter changing to spring |                             |

39 The diagram below shows an area before and after a housing development was built there.



Before Development



After Development

(Not drawn to scale)

Describe **two negative** ways that the animals living in the area have been affected by the changes shown in the diagram. [2]

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

\_\_\_\_\_

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

\_\_\_\_\_

40 The chart below shows the main functions of some green plant structures. Complete the chart by identifying the structure that performs **each** function. The green plant structure in the first row is shown. [2]

**Main Functions of Some Green Plant Structures**

| Main Function                | Green Plant Structure |
|------------------------------|-----------------------|
| supports the plant           | stem                  |
| produces food for the plant  |                       |
| takes in water and nutrients |                       |
| produces seeds               |                       |

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GRADE 4 ELEMENTARY-LEVEL SCIENCE

**For Teacher Use Only  
Part II Credit**

| <b>Question</b> | <b>Maximum<br/>Credit</b> | <b>Credit<br/>Allowed</b> |
|-----------------|---------------------------|---------------------------|
| <b>31</b>       | <b>2</b>                  |                           |
| <b>32</b>       | <b>1</b>                  |                           |
| <b>33</b>       | <b>1</b>                  |                           |
| <b>34</b>       | <b>1</b>                  |                           |
| <b>35</b>       | <b>2</b>                  |                           |
| <b>36</b>       | <b>1</b>                  |                           |
| <b>37</b>       | <b>1</b>                  |                           |
| <b>38</b>       | <b>2</b>                  |                           |
| <b>39</b>       | <b>2</b>                  |                           |
| <b>40</b>       | <b>2</b>                  |                           |
| <b>Total</b>    | <b>15</b>                 |                           |