

**GRADE 4 ELEMENTARY-LEVEL
SCIENCE TEST**

WRITTEN TEST SAMPLER DRAFT

May 2003

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Office of Curriculum, Instruction, and Assessment
Albany, New York 12234
www.emsc.nysed.gov/ciai/

THE UNIVERSITY OF THE STATE OF NEW YORK
Regents of The University

ROBERT M. BENNETT, <i>Chancellor</i> , B.A., M.S.	Tonawanda
ADELAIDE L. SANFORD, <i>Vice Chancellor</i> , B.A., M.A., P.D.	Hollis
DIANE O'NEILL MCGIVERN, B.S.N., M.A., Ph.D.	Staten Island
SAUL B. COHEN, B.A., M.A., Ph.D.	New Rochelle
JAMES C. DAWSON, A.A., B.A., M.S., Ph.D.	Peru
ROBERT M. JOHNSON, B.S., J.D.	Huntington
ANTHONY S. BOTTAR, B.A., J.D.	North Syracuse
MERRYL H. TISCH, B.A., M.A.	New York
GERALDINE D. CHAPEY, B.A., M.A., Ed.D.	Belle Harbor
ARNOLD B. GARDNER, B.A., LL.B.	Buffalo
HARRY PHILLIPS, 3 rd , B.A., M.S.F.S.	Hartsdale
JOSEPH E. BOWMAN, JR., B.A., M.L.S., M.A., M.Ed., Ed.D.	Albany
LORRAINE A. CORTÉS-VÁZQUEZ, B.A., M.P.A.	Bronx
JUDITH O. RUBIN, A.B.	New York
JAMES R. TALLON, JR., B.A., M.A.	Binghamton
MILTON L. COFIELD, B.A., M.B.A., Ph.D.	Rochester

President of The University and Commissioner of Education

RICHARD P. MILLS

Chief Operating Officer

RICHARD H. CATE

Deputy Commissioner for Elementary, Middle, Secondary, and Continuing Education

JAMES A. KADAMUS

Assistant Commissioner for Curriculum, Instruction, and Assessment

ROSEANNE DEFABIO

The State Education Department does not discriminate on the basis of age, color, religion, creed, disability, marital status, veteran status, national origin, race, gender, genetic predisposition or carrier status, or sexual orientation in its educational programs, services, and activities. Portions of this publication can be made available in a variety of formats, including braille, large print or audio tape, upon request. Inquiries concerning this policy of nondiscrimination should be directed to the Department's Office for Diversity, Ethics, and Access, Room 152, Education Building, Albany, NY 12234.



May 2003

Dear Colleagues:

Following several years of planning, pretesting, field testing, and scoring different types of questions, the Grade 4 Elementary-Level Science Written Test Sampler Draft is ready for distribution. School districts, science teachers, supervisors, and administrators have assisted the State Education Department in the development process in a variety of ways. Teachers have developed and reviewed the test items and rating guides and field tested items with their students. Administrators have arranged for their students to participate in the pretest and field-test samples. Teachers and supervisors will continue to develop, pretest, and field-test different types of questions for future Elementary-Level Science Tests.

This written test sampler is being posted on the New York State Education Department's website: www.emsc.nysed.gov/ciai/. Administrators should make copies available to all K-4 science teachers. The test sampler provides examples of the types of questions, formats, and scoring guides that are being developed for the Grade 4 Elementary-Level Science Written Test that will be administered for the first time in spring 2004. We expect that further refinements of the question formats and scoring guides will occur as a result of field tests that will be conducted this spring.

Since a grade 4 science performance test has been given for a number of years, no performance test sampler is being provided. We hope that this written test sampler, along with the core curriculum guide, assists you in preparing students for the new science test. If you have any questions, or need additional information, please contact Ann Crotty at (518) 474-5922.

We are interested in receiving your feedback on these preliminary materials. A comment sheet is included at the end of the test sampler so that you may forward your responses to us. The comment sheet may be faxed to (518) 473-0858 or mailed to the address listed below:

New York State Education Department
Office of Curriculum and Instruction
Room 674 EBA
Albany, New York 12234

Sincerely,

Roseanne DeFabio

Acknowledgments

The State Education Department acknowledges the assistance of the many teachers and school administrators from across New York State who helped develop test items for this written test sampler. The State Education Department would like to thank the following elementary-level science educators:

Sharyn Berliner	Shelter Rock Elementary School, Manhasset
Julie Brinkman	SUNY New Paltz
Edward Bronson	Penn Yan Elementary School
Kristina Brown	Dannemora Elementary School
Denise Brown	Gateway Environmental Studies Center, Brooklyn
Michelle Cambier	New York City Community School District 32, Brooklyn
Dennis Desain	Averill Park Central Schools
Rebecca Fast	Buffalo City School District
Lisa Febraio	F.L Stevens Elementary School, Ballston lake
Michael Flood	Onondaga-Cortland-Madison BOCES, Syracuse
Einie Frangella-Stine	Becker Elementary School, Selkirk
Jacqueline Garelick	Margaretville Central School
Fran Hess	Cooperstown High School
Mike Jabot	SUNY Fredonia
Sandra Jenoure	New York City Community School District 4, New York
Clare Josef	Buffalo City School District
Linda Kostun	Troy City School District
Laura Lehtonen	Capital Region BOCES, Latham
Mary Marcinkowski	Buffalo City School District, Niagra Falls
Colleen Millington-Kelley	Gardner Dickinson School, Wynantskill
Linda Morris	Mt. Pleasant School, Schenectady
Dolly Narain-Kranz	Syosset Central School District
Theresa O'Brien	Watervliet City Schools
Mary O'Keefe	Notre Dame School, New Hyde Park
Guy Schiavi	Buffalo City School District
Toni Schroeder	Harmony Hill Elementary School, Cohoes
Michael Simons	Ithaca City School District
Carolyn Smith	Troy City School District
Mary Thomas	Monroe #2 Orleans BOCES, Spencerport
Johanna Tomik	Haviland Middle School, Hyde Park
Robert Whiteman	Westmere Elementary School, Guilderland
Dawn Zopff	Harry L. Johnson Elementary School, Johnson City

New York State Education Department staff who contributed to this document were Ann Crotty, Associate in Science Education; Judy Pinsonnault, Associate in Educational Testing; and Evan Murphy, Assistant Examinations Editor. Special thanks go to Jan Christman for technical expertise.

Additional thanks for development of the Grade 4 Elementary-Level Science Performance Test, Form A go to project managers Rod Doran and Doug Reynolds. The Department would also like to thank the following elementary-level science educators who helped in the development of the performance test:

Greg Borman	NYC Dept of Education, Division of Instructional Support
Lisa Febraio	F.L Stevens Elementary School, Ballston lake
Einie Frangella-Stine	Becker Elementary School, Selkirk
Jacqueline Garelick	Margaretville Central School
Sandra Jenoure	New York City Community School District 4, New York
Mary Marcinkowski	Buffalo City School District
Linda Morris	Mt. Pleasant School, Schenectady
Theresa O'Brien	Watervliet City Schools
Carolyn Smith	Troy City School District
MaryJean Syrek	Buffalo City School District

Contents

Acknowledgments	iv
Introduction	1
Sample Test Items	
Part A	3
Part B	7
Part C	15
Answer Sheet for Multiple-Choice Questions in Parts A and B	17
Sample Scoring Materials for Parts A, B, and C	
Scoring Key for Multiple-Choice Questions	18
Rating Guide for Constructed Response and Extended Constructed Response Questions in Parts B and C	19
Appendices	
Appendix A	
Item Map to New York State Learning Standards and Core Curriculum ..	22
Appendix B	
Reference to “Elementary-Level Science Core Curriculum, Grades K-4” ..	24
Comment Sheet	25

Introduction

The new Grade 4 Elementary-Level Science Written Test (grades K–4) has been developed to assess student achievement of Standards 1, 2, 4, 6, and 7 of the *Learning Standards for Mathematics, Science, and Technology*. Items for the new Grade 4 Elementary-Level Science Written Test were developed through the cooperative efforts of teachers, school districts, science educators, and State Education Department staff.

Questions will be content- and skills-based and may require students to graph; interpret data tables, models, and diagrams; evaluate experiments; or write responses to open-ended questions. As outlined in the Scientific Inquiry section of the *Learning Standards for Mathematics, Science, and Technology*, students may be asked to interpret, analyze, and evaluate data and apply their scientific knowledge and skills to real-world situations.

The written test will be administered to students at the end of grade 4. The test will not be timed, but most students should finish in one hour or less. Students should be prepared to answer questions in multiple-choice, constructed response, and extended constructed response formats. In addition, a performance test that will assess students’ laboratory skills will be administered in a separate one-hour test session.

Students will be required to answer all of the questions on both tests. Teachers will score both the written and performance tests in their districts, following rating guidelines provided by the New York State Education Department.

The first table below shows the approximate percentage of the test that addresses each of the five relevant learning standards. The second shows the approximate percentages devoted to specific parts of the test.

New York State Grade 4 Elementary-Level Science Test Blueprints

Area in New York State <i>Elementary-Level Science Core Curriculum (K-4)</i>	Approximate Percentage of the Test
Standard 1 – Mathematical Analysis, Scientific Inquiry, and Technological Design	25–30%
Standard 2 – Information Systems	0–5%
Standard 4 –The Living Environment; The Physical Setting	60–70%
Standard 6 – Interconnectedness: Common Themes	5–10%
Standard 7 – Interdisciplinary Problem Solving	0–5%

Parts of the Test (item formats and purposes)			Approximate Percentage of the Test
Written Test	Part A Multiple-choice items	Content-based questions assessing the student’s knowledge and understanding of core material (primarily from Standard 4)	35–40%
	Part B Multiple-choice and constructed-response items	Content- and skills-based questions assessing the student’s ability to apply, analyze, and evaluate material (primarily from Standards 1 and 4)	15–20%
	Part C Constructed-response and extended items	Content and application questions assessing the student’s ability to apply knowledge of science concepts and skills to address real-world situations constructed response (primarily from Standards 1, 2, 4, 6, and 7)	15–20%
Performance Test	Part D Open-ended items	Application questions assessing the student’s skills in using hands-on equipment and materials in his or her responses to the questions posed (primarily from Standard 1)	25%

Schools will use a conversion table to convert each student's score on the written and performance tests into a final test score. Students' final scores will fall into one of several performance levels. In accordance with Commissioner's Regulations 100.2, students who score below the State designated performance level on the Elementary-Level Science Test must be provided academic intervention services (AIS) by their school by the start of the next school year. The State designated performance level will be established by a standard-setting process using student responses from elementary-level science field tests administered in Spring 2003.

Test modifications must be consistently provided to students with disabilities when it is determined that such accommodations are necessary. Such modifications must be documented in either an Individualized Education Plan (IEP) or in a Section 504 Accommodation Plan. The various State assessments are being developed by both special and general educators to ensure they are appropriate for students with disabilities.

The tasks in this written test sampler may be administered in the classroom to help teachers plan for instruction. Sometime before taking the sample test, students should be introduced to the question format, response format, and rating guidelines. Teachers are encouraged to use the rating guide in this document for practice in rating student papers. Teachers and administrators are encouraged to reproduce the sample tests and scoring materials as needed.

Appendix A contains an item map that illustrates which items on the test are related to the various key ideas in the *Elementary-Level Science Core Curriculum* (K-4). Appendix B contains a chart that contains similar information for each item in the written test sampler. The information in these appendices can help teachers identify specific areas of the standards and core curriculum in which students might need additional instruction.

In considering implications of the results for curricular planning, teachers may want to ask the following questions:

- On which parts/standards did students seem to be most successful? least successful?
- To what extent did students follow the guidelines included with each question type?
- What learning experiences do students need to perform well on each question?
- What opportunities do students in grades K-4 have to engage in a science instructional program that includes activities requiring higher-order thinking skills?

Teachers who have participated in the development of this test maintain that teachers can make a significant difference in how well their students will score on the new science assessment. Students need multiple opportunities to practice with the written test sampler. Test-taking strategies can be taught; students who have been trained in these skills are likely to score better.

New York State
Grade 4 Elementary-Level Science Written Test Sampler

Part A: Sample Questions 1–17

Directions (1–17): Each question is followed by three or four choices. Decide which choice best completes the statement or answers the question. On the separate answer sheet, record your answers in the spaces provided by writing the same *letter* as the answer you have chosen.

- 1 Which cycle is correct?
 - A morning → sunrise → afternoon → sunset
 - B summer → fall → winter → spring
 - C seed → mature plant → fruit → seedling
 - D baby → teenager → child → adult

- 2 Which statement explains why the Sun appears to rise and set each day?
 - A Earth rotates.
 - B The Sun rotates.
 - C The Sun revolves around Earth.
 - D Earth revolves around the Sun.

- 3 Which statement describes the general path the Sun takes as it appears to move across the sky for an observer in New York State?
 - A The Sun rises in the west and sets in the east.
 - B The Sun rises in the east and sets in the west.
 - C The Sun rises in the north and sets in the south.
 - D The Sun rises in the south and sets in the north.

- 4 Which unit is used to measure how warm or cool the air is?
 - A grams
 - B kilometers
 - C degrees Celsius
 - D cubic centimeters

- 5 A soil sample contains living and nonliving materials. Which material was once living?
- A sand particles
 - B decomposing leaves
 - C small pebbles
 - D water droplets
- 6 Water is boiled in a pan on a stove. The state of matter of the water changes from
- A liquid to solid
 - B solid to liquid
 - C gas to liquid
 - D liquid to gas
- 7 Which kind of energy is produced when a student beats a drum?
- A electrical
 - B sound
 - C light
 - D chemical
- 8 Electricity traveling through a wire is an example of
- A a force applied by a simple machine
 - B energy flowing through the water cycle
 - C Earth's gravitational pull on an object
 - D energy being transferred from place to place
- 9 Which forms of energy are produced by a burning candle?
- A heat and mechanical
 - B electrical and sound
 - C light and electrical
 - D heat and light

- 10 A toaster changes electrical energy to
- A heat energy
 - B solar energy
 - C sound energy
 - D magnetic energy
- 11 In order to survive, all animals need
- A roots, leaves, and stems
 - B eyes, nose, and ears
 - C light, soil, and nutrients
 - D food, water, and air
- 12 What does a seed contain that provides energy for germination?
- A water
 - B stored food
 - C soil
 - D sunlight
- 13 The main purpose of a plant's flowers is to
- A provide support
 - B provide water
 - C produce seeds
 - D produce food

14 Which color fur will best protect a rabbit from a hawk in a snowy field?

- A brown
- B gray
- C white
- D black

15 Which food is an example of a healthy snack?

- A an apple
- B a candy bar
- C cookies
- D potato chips

16 What is one healthy way that people can help to maintain their weight?

- A washing their hands regularly
- B brushing their teeth twice daily
- C sleeping 8 hours daily
- D exercising regularly

17 What is the role of a producer in a food chain?

- A preys on animals
- B eats decayed animals
- C makes food
- D eats plants

**New York State
Grade 4 Elementary-Level Science Written Test Sampler**

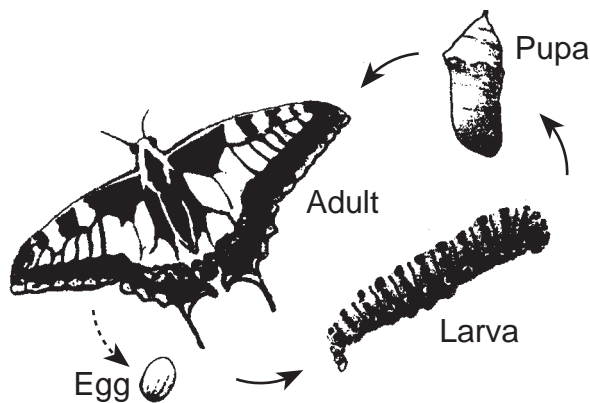
Part B: Sample Questions 18–36

Directions (18–30): Each question is followed by three or four choices. Decide which choice best completes the statement or answers the question. On the separate answer sheet, record your answers in the spaces provided by writing the same *letter* as the answer you have chosen.

- 18 The diagram below shows a potato plant in a cup. The cup was originally filled to the top with water. Which statement best explains why the cup no longer contains water?



- A The water froze.
 - B The water condensed.
 - C The water was taken in by the roots.
 - D The water was moved by gravity.
- 19 What is shown in the diagram below?



- A a life span
- B a population
- C a life cycle
- D a community

20 Which list below best shows how energy moves in a food chain?

- A grass → cows → humans → Sun
- B Sun → grass → cows → humans
- C humans → cows → grass → Sun
- D cows → grass → Sun → humans

Base your answers to questions 21 and 22 on the food chain below.



21 In this food chain, the green plants are

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

22 The frogs in this food chain get their energy directly from

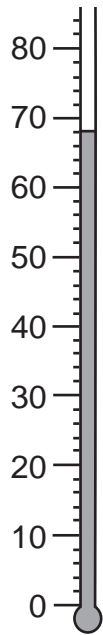
- A eating the insects
 - B being eaten by the snakes
 - C eating other frogs
 - D eating green plants
-

- 23 The chart below shows temperatures recorded from Monday though Friday during a week in June.

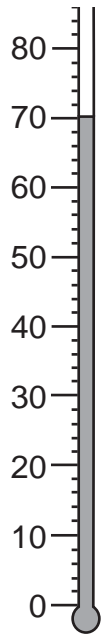
Temperatures for the Week

Day	Temperature (°F)
Monday	72
Tuesday	76
Wednesday	68
Thursday	70
Friday	70

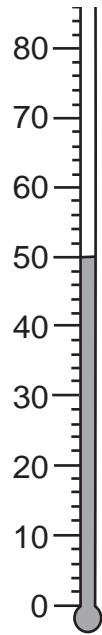
Which thermometer shows the temperature recorded on Wednesday?



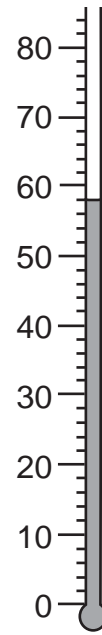
(A)



(B)



(C)



(D)

Note that question 24 has only three choices.

- 24 The chart below shows how long it took a seed to sprout at three different temperatures.

Temperature	Days Needed to Sprout
60° F	15
65° F	13
70° F	11

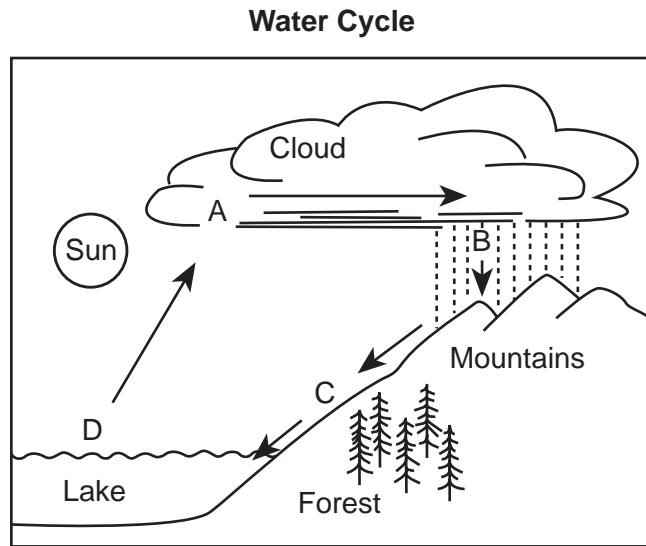
Based on the chart, how long will it take for the same kind of seed to sprout at 75° F?

- A 11 days
 - B more than 11 days
 - C less than 11 days
- 25 A student planted the same kind of seeds in pots *A* and *B*. She planted five seeds in pot *A* and five seeds in pot *B*. The amount and type of soil in both pots was the same. She added the same amount of water to both pots each week. Pot *A* was placed by a sunny window. Pot *B* was placed in a dark room. After four weeks, she observed the plants in both pots. The plants in pot *A* were green, with tall, thick stems. The plants in pot *B* were yellow, with tall, thin stems.

Which statement best explains why the plants in pot *A* were different from the plants in pot *B*?

- A Pot *A* contained more soil than pot *B*.
- B Pot *A* contained more seeds than pot *B*.
- C Pot *A* received more sunlight than pot *B*.
- D Pot *A* received more water than pot *B*.

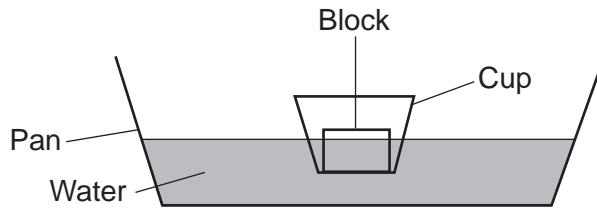
Base your answers to questions 26 through 28 on the water cycle shown below. Four parts of the water cycle are labeled *A*, *B*, *C*, and *D*.



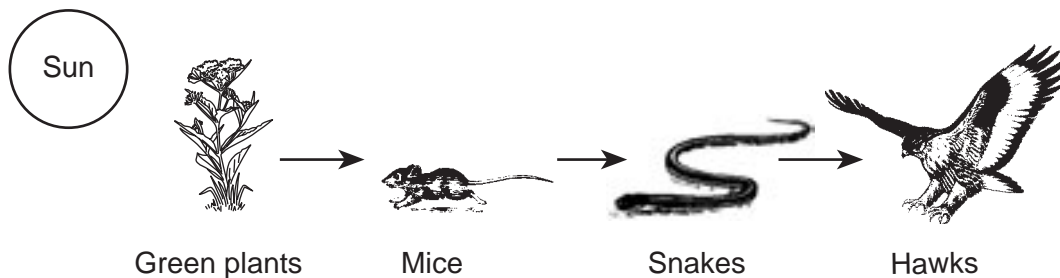
- 26 Which process is occurring at *D*?
- A condensation
 - B evaporation
 - C precipitation
 - D runoff
- 27 Water flowing on Earth's surface at *C* is called
- A condensation
 - B evaporation
 - C precipitation
 - D runoff
- 28 Which process is occurring at *B*?
- A condensation
 - B evaporation
 - C precipitation
 - D runoff
-

Note that question 29 has only three choices.

- 29 A plastic cup containing a wood block is floating in a pan of water as shown in the diagram below. If another wood block is placed in the cup, what will happen to the level of water in the pan?



- A It will go down.
 - B It will go up.
 - C It will stay the same.
- 30 A food chain is shown below.



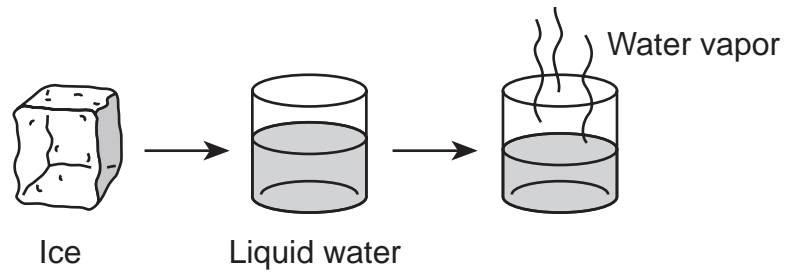
(Not drawn to scale)

Which population would most likely *decrease* if the number of mice greatly increased?

- A green plants
- B mice
- C snakes
- D hawks

Directions (31–36): Record your answers in the space provided below each question.

Base your answers to questions 31 through 33 on the diagrams below and on your knowledge of science.



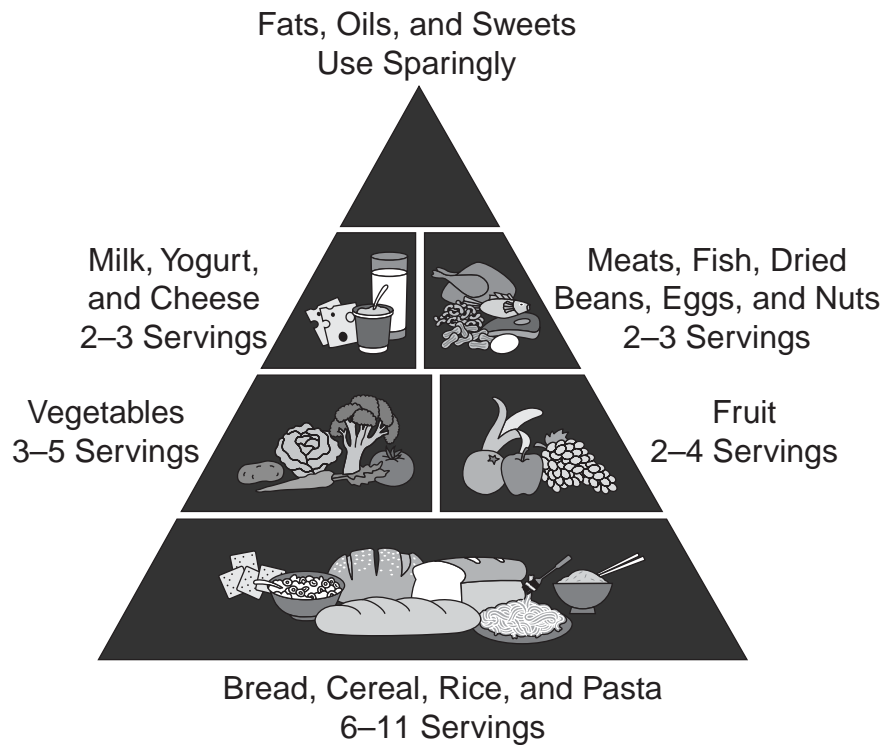
31 Which type of energy must be added for the ice to change to liquid water? [1]

32 In which diagram does water have a definite shape and volume? [1]

Circle one: Ice Liquid water Water vapor

33 Which state of matter is water vapor? [1] _____

Base your answers to questions 34 through 36 on the picture of a Food Guide Pyramid below. People can use suggestions from the Food Guide Pyramid to help plan daily meals. The pyramid tells how many servings each day should come from each of the six food groups.



34 From which group should a person have the greatest number of servings daily? [1]

35 How many servings of the vegetable group should a person have every day? [1]

_____ servings

36 Why is it important to eat foods from each group every day? [1]

**New York State
Grade 4 Elementary-Level Science Written Test Sampler**

Part C

Directions (37–41): Record your answers in the space provided below each question.

Base your answers to questions 37 and 38 on the chart below and on your knowledge of science.

- 37 Humans and other animals have some traits that are inherited from their parents and others that are learned. In the chart below, place an *X* in the correct column to identify each trait as either inherited or learned. [2]

Trait	Inherited	Learned
Brown hair		
Riding a bicycle		
Reading a book		
Blue eyes		
Blowing a bubble		

- 38 Identify *one* other trait that a human can learn that is *not* included in the chart above. [1]

- 39 An ice cube was put in a pan and placed in a warm room for one hour. Identify *two* physical properties of the ice cube that will change as it melts to a liquid. [2]

(1) _____

(2) _____

Base your answers to questions 40 and 41 on the animals shown below.

- 40 Choose *one* of the animals shown and explain *one* adaptation that helps this animal to survive in winter. [1]



Frog



Bear



Bird

(not drawn to scale)

Animal: _____

Adaptation:

- 41 Choose *one* of the animals shown. In the first column of the chart below, identify *three* body parts that this animal uses to help it survive. In the second column, explain how the animal uses each body part to help it survive. [3]

Animal: _____

Body Part	How the Animal Uses the Body Part to Help it Survive

**New York State
Grade 4 Elementary-Level Science Written Test Sampler**

Student Answer Sheet for Multiple-Choice Questions 1–30

Part A

- 1** _____
- 2** _____
- 3** _____
- 4** _____
- 5** _____
- 6** _____
- 7** _____
- 8** _____
- 9** _____
- 10** _____
- 11** _____
- 12** _____
- 13** _____
- 14** _____
- 15** _____
- 16** _____
- 17** _____

Part B

- 18** _____
- 19** _____
- 20** _____
- 21** _____
- 22** _____
- 23** _____
- 24** _____
- 25** _____
- 26** _____
- 27** _____
- 28** _____
- 29** _____
- 30** _____

**New York State
Grade 4 Elementary-Level Science Written Test Sampler**

Scoring Key for Multiple-Choice Questions 1–30

Part A		Part B	
1	<u> B </u>	18	<u> C </u>
2	<u> A </u>	19	<u> C </u>
3	<u> B </u>	20	<u> B </u>
4	<u> C </u>	21	<u> A </u>
5	<u> B </u>	22	<u> A </u>
6	<u> D </u>	23	<u> A </u>
7	<u> B </u>	24	<u> C </u>
8	<u> D </u>	25	<u> C </u>
9	<u> D </u>	26	<u> B </u>
10	<u> A </u>	27	<u> D </u>
11	<u> D </u>	28	<u> C </u>
12	<u> B </u>	29	<u> B </u>
13	<u> C </u>	30	<u> A </u>
14	<u> C </u>		
15	<u> A </u>		
16	<u> D </u>		
17	<u> C </u>		

**New York State
Grade 4 Elementary-Level Science Written Test Sampler**

**Rating Guide for Constructed-Response and
Extended Constructed-Response Questions in Parts B and C**

Note: When answers appear in bold, allow credit for only those answers. In other cases, examples of correct answers are provided. Correct answers include, but are not limited to, these answers. Raters must use their judgement to decide if the student’s answer meets the criteria.

- 31** [1] Allow 1 credit for a correct answer.
- Correct answers include:
- heat
 - heat energy
 - thermal energy
- 32** [1] Allow 1 credit if **ice** is circled.
- 33** [1] Allow 1 credit for **gas**.
- 34** [1] Allow 1 credit for identifying the group from which a person should have the greatest number of servings.
- Correct answers include:
- bread, cereal, rice, and pasta group
 - the lowest level
 - the bottom level
 - 6–11 servings
- 35** [1] Allow 1 credit for **3–5** or **3, 4, or 5**.
- 36** [1] Allow 1 credit for stating that eating foods from each group helps the body get the nutrients it needs to stay healthy and grow.
- Correct answers include:
- It is important in order to stay healthy.
 - Because your body needs energy and nutrients.
 - Because all the groups are good for you.

- 37 [2] Allow 2 credits for four or five correct **X**s in the table.
Allow 1 credit for only one to three correct **X**s in the table.

Trait	Inherited	Learned
Brown hair	X	
Riding a bicycle		X
Reading a book		X
Blue eyes	X	
Blowing a bubble		X

- 38 [1] Allow 1 credit for identifying one trait that a human can learn that is not included in the chart.

Correct answers include:

- using a computer
- playing an instrument
- drawing
- writing
- tap dancing
- skateboarding

- 39 [2] Allow a maximum of 2 credits, 1 for each property of the ice cube that will change as it melts.

Correct answers include:

- solid to liquid
- shape
- texture
- hardness
- size/volume

Note: Do *not* allow credit for mass or weight. These properties would remain the same.

- 40 [1] Allow 1 credit for explaining one adaptation that helps the animal chosen survive in winter. **Note:** Correct answers must refer to the animal the student chose, as well as provide an explanation, e.g., “grow thicker fur” not simply “have fur.”

Correct answers for the three animals include:

Animal:	Bear
Adaptation:	grow thick fur/hibernate/get fatter
Animal:	Bird
Adaptation:	migrate south/grow thicker feathers
Animal:	Frog
Adaptation:	burrow in the mud

- 41 [3] Allow a maximum of 3 credits, 1 for each body part chosen that is correctly paired with how the animal uses it to survive.

Correct answers include:

Animal	Body Part	How the Animal Uses the Body Part to Help it Survive
Frog	<ul style="list-style-type: none"> — legs — eyes — feet — tongue 	<ul style="list-style-type: none"> — jump to catch flies — near top of head to see above water — webbed to swim faster — catch food
Bear	<ul style="list-style-type: none"> — ears — legs — teeth — claws 	<ul style="list-style-type: none"> — hear predators — escape predators — strong to eat vegetation — protection, catch prey
Bird	<ul style="list-style-type: none"> — wings — beak — eyes — feathers 	<ul style="list-style-type: none"> — migrate — eat seeds or grubs or other things — see and escape danger — warmth/insulation

New York State Grade 4 Elementary-Level Science Written Test Sampler

Appendix A

Item Map for Elementary-Level Science Written Test Sampler

The item map below references each test item in the written test sampler to the *Elementary-Level Science Core Curriculum: Grades K-4*. When an item measures more than one idea or learning standard, the item number will appear in more than one place.

NYS Learning Standards for Mathematics, Science, and Technology Standard/Area	NYS Learning Standards for Mathematics, Science, and Technology Key Idea in Core Curriculum	Written Test Sampler Item Number
Standard 1 Mathematical Analysis	M 1 Abstraction and symbolic representation are used to communicate mathematically	
	M 2 Deductive and inductive reasoning are used to reach mathematical conclusions.	24
	M 3 Critical thinking skills are used in the solution of mathematical problems.	
Standard 1 Scientific Inquiry Key Idea 1 The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.	S 1.1 Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.	
	S 1.2 Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.	
	S 1.3 Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed	25
Standard 1 Scientific Inquiry Key Idea 2 Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.	S 2.1 Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.	
	S 2.2 Share their research plans with others and revise them based on their suggestions.	
	S 2.3 Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurement of quantities such as length, mass, volume, temperature, and time.	
Standard 1 Scientific Inquiry Key Idea 3 The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insight to phenomena.	S 3.1 Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.	37, 41
	S 3.2 Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.	23
	S 3.3 Share their findings with others and actively seek their interpretations and ideas.	
	S 3.4 Adjust their explanations and understandings of objects and events based on their findings and new ideas.	
Standard 1 Engineering Design	1.1–1.5	
Standard 2 Information Systems	1–3	

NYS Learning Standards for Mathematics, Science, and Technology Standard/Area	NYS Learning Standards for Mathematics, Science, and Technology Key Idea in Core Curriculum	Written Test Sampler Item Number
Standard 4 Physical Setting	1 Earth and celestial phenomena can be described by principles of relative motion and perspective.	1,2,3
	2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.	4,5,26,27,28
	3 Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.	6,32,33,39
	4 Energy exists in many forms, and when these forms change energy is conserved.	7,8,9,10,31
	5 Energy and matter interact through forces that result in changes in motion.	
Standard 4 Living Environment	1 Living things are both similar to and different from each other and from nonliving things.	1
	2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.	37,38
	3 Individual organisms and species change over time.	12,13,18,41
	4 The continuity of life is sustained through reproduction and development.	19
	5 Organisms maintain a dynamic equilibrium that sustains life.	14,15,16,36,40
	6 Plants and animals depend on each other and their physical environment.	17,20,21,22,25
	7 Human decisions and activities have had a profound impact on the physical and living environment.	
Standard 6 Interconnectedness and Common Themes	1 Systems Thinking	18,19,20,21,2
	2 Models	2,26,27,28,32,34,35
	3 Magnitude and Scale	
	4 Equilibrium and Stability	
	5 Patterns of Change	29,39
	6 Optimization	30
Standard 7 Interdisciplinary PS	1 Connections	
	2 Strategies	

**New York State
Grade 4 Elementary-Level Science Written Test Sampler**

Appendix B

Reference to Elementary-Level Core Curriculum for Individual Items

Item #	MST Learning Standard	Content Area within Standard 4 (Physical Setting or Living Environment)	Major Understanding	Other Learning Standards, Key Ideas, Major Understandings, or Skills	Part of Written Test	Points
1	4	PS	1.1a	1.1b	A	1
2	4	PS	1.1a	1.1c	A	1
3	4	PS	1.1c	1.1a	A	1
4	4	PS	2.1b	Skill ii	A	1
5	4	PS	2.1d		A	1
6	4	PS	3.2b		A	1
7	4	PS	4.1d	4.1a	A	1
8	4	PS	4.1b	4.1e	A	1
9	4	PS	4.1f	4.1a	A	1
10	4	PS	4.2b		A	1
11	4	LE	1.1a		A	1
12	4	LE	3.1b		A	1
13	4	LE	3.1b		A	1
14	4	LE	5.2e		A	1
15	4	LE	5.3a		A	1
16	4	LE	5.3b	5.3a	A	1
17	4	LE	6.1a		A	1
18	4	LE	3.1b	St 6 KI 2	B1	1
19	4	LE	4.1e	4.1f; St 6 KI 2	B1	1
20	4	LE	6.2b	Skill ix	B1	1
21	4	LE	6.1a	6.2b; St 6 KI 2	B1	1
22	4	LE	6.1b	St 6 KI 2	B1	1
23	1		M 3.1a	S 3.2; Skill ii	B1	1
24	1		S 3.2	M 2.1b	B1	1
25	4	LE	6.2a	St 1 S 1.3	B1	1
26	4	PS	2.1c	St 6 KI 2	B1	1
27	4	PS	2.1c	St 6 KI 2	B1	1
28	4	PS	2.1c	St 6 KI 2	B1	1
29	6		KI 4	PS 3.1a, 3.1e; Skill xix	B1	1
30	6		KI 5	LE 6.1c	B1	1
31	4	PS	4.1d	3.1g, 3.2b	B2	1
32	4	PS	3.2a	St 6 KI 2	B2	1
33	4	PS	3.2a		B2	1
34	6		KI 2	LE 5.3	B2	1
35	6		KI 2	LE 5.3	B2	1
36	4	LE	5.3		B2	1
37	4	LE	2.1a	2.1b; St 1 S 3.1	C	2
38	4	LE	2.1b		C	1
39	4	PS	3.1g	3.2b; St 6 KI 4	C	2
40	4	LE	5.2f	5.2e	C	1
41	4	LE	3.1a	St 1 S 3.1	C	3



New York State Education Department, Room 674 EBA, Albany, NY 12234

**Elementary-Level Science
Written Test Sampler Draft, Spring 2003
Comment Sheet**

Please circle "Yes" or "No" and share your comments for each question below.

- | | | |
|--|-----|----|
| 1. Content —Are the questions generally appropriate in content?
<i>Comments:</i> | YES | No |
| 2. Difficulty —Are the questions generally appropriate in difficulty?
<i>Comments:</i> | YES | No |
| 3. Directions —Are the directions in the Test Sampler Draft clear and easy for students to follow?
<i>Comments:</i> | YES | No |
| 4. Scoring Guidelines —Is the Rating Guide for Parts B and C clear and easy for teachers to follow?
<i>Comments:</i> | YES | No |
| 5. Additional Comments: | | |

Please fax this sheet to (518) 473-4884 or mail it to the New York State Education Department at the above address by November 30, 2003.

New York State Education Department
Albany, New York 12234

NON-PROFIT ORG.
U.S. POSTAGE
PAID
Albany, N.Y.
Permit No. 293