

Item Maps

New York State Grade 4 Elementary-Level Science Test

May 2004 Written Test
Performance Test Form A

Reference to *Elementary-Level Science Core Curriculum Grades K-4*
Reference to Process Skills Based on Standard 4
Reference to Core Curriculum for Individual Test Questions

Note: Core curriculum is based on *NYS Learning Standards for Mathematics, Science, and Technology*.

<i>NYS Learning Standards for Mathematics, Science, and Technology Standard/Area</i>	Reference to <i>Elementary-Level Science Core Curriculum Grades K-4</i> Key Idea or Performance Indicator	Performance Test Form A Question Number			May 2004 Written Test Question Number
		Station 1	Station 2	Station 3	
Standard 1 Mathematical Analysis	M1 Abstraction and symbolic representation are used to communicate mathematically.	1, 2, 4, 5		1	
	M2 Deductive and inductive reasoning are used to reach mathematical conclusions.			3, 5	16
	M3 Critical thinking skills are used in the solution of mathematical problems.	1, 2, 4	1, 3	1	23
Standard 1 Scientific Inquiry Key Idea 1	S1.1 Ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.				
	S1.2 Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.		4		
	S1.3 Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.		2		34
Standard 1 Scientific Inquiry Key Idea 2	S2.1 Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.				
	S2.2 Share their research plans with others and revise them based on their suggestions.				
	S2.3 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.			1	
Standard 1 Scientific Inquiry Key Idea 3	S3.1 Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.		1, 3		
	S3.2 Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.		2, 4	2, 3	16, 31, 32, 33
	S3.3 Share their findings with others and actively seek their interpretations and ideas.		4		
	S3.4 Adjust their explanations and understandings of objects and events based on their findings and new ideas.			4, 5	
Standard 1 Engineering Design	T1.1 -T1.5 Engineering design is an iterative process involving modeling and optimization to develop technological solutions to problems within given constraints.			4	

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		Station 1	Station 2	Station 3	
Standard 2 Information Systems	1 Information technology is used to retrieve, process, and communicate information as a tool to enhance learning.				18
	2 Knowledge of the impacts and limitations of information systems is essential to its effectiveness and ethical use.				
	3 Information technology can have positive and negative impacts on society, depending upon how it is used.				
Standard 4 Physical Setting	1 Earth and celestial phenomena can be described by principles of relative motion and perspective.				1, 16
	2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.				2, 7, 8, 18
	3 Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.	1, 2, 3, 4, 5	1, 2		3, 4, 6, 17, 19, 20, 21, 23, 28
	4 Energy exists in many forms, and when these forms change energy is conserved.		1, 2		4, 5, 6, 22, 25, 26
	5 Energy and matter interact through forces that result in changes in motion.		3, 4	1, 2, 3, 4, 5	27, 30
Standard 4 Living Environment	1 Living things are both similar to and different from each other and from nonliving things.				36, 37
	2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.				9
	3 Individual organisms and species change over time.				10, 11, 12, 13, 24, 34
	4 The continuity of life is sustained through reproduction and development.				14, 31, 32
	5 Organisms maintain a dynamic equilibrium that sustains life.				15, 29, 35, 36, 37
	6 Plants and animals depend on each other and their physical environment.				34, 38, 39, 40
	7 Human decisions and activities have had a profound impact on the physical and living environment.				41

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		Station 1	Station 2	Station 3	
Standard 6 Interconnectedness: Common Themes	1 Systems Thinking Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions.				25
	2 Models Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.				17, 18, 25, 36, 37, 38, 39, 40
	3 Magnitude and Scale The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.				
	4 Equilibrium and Stability Equilibrium is a state of stability due either to a lack of change (static equilibrium) or a balance between opposing forces (dynamic equilibrium).				30
	5 Patterns of Change Identifying patterns of change is necessary for making predictions about future behavior and conditions.			2, 3	
	6 Optimization In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs.			5	41
Standard 7 Interdisciplinary Problem Solving	1 Connections The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those related to issues of science/technology/society, consumer decision-making, design, and inquiry into phenomena.				19
	2 Strategies Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.				

**Grade 4 Elementary-Level Science Core Curriculum Grades K-4
Reference to Process Skills Based On Standard 4**

Process Skills–General Skills	Performance Test Form A Question Number			May 2004 Written Test Question Number
	Station 1	Station 2	Station 3	
i follow safety procedures in the classroom, laboratory, and field				
ii safely and accurately use the following tools: hand lens, ruler (metric), balance, gram weights, spring scale, thermometer (C°, F°), measuring cups, graduated cylinder, timepiece(s)	1, 2, 4			
iii develop an appreciation of and respect for all learning environments (classroom, laboratory, field, etc.)				
iv manipulate materials through teacher direction and free discovery				
v use information systems appropriately				
vi select appropriate standard and nonstandard measurement tools for measurement activities	1, 2, 4			28
vii estimate, find, and communicate measurements, using standard and nonstandard units	1, 2, 4, 5			23
viii use and record appropriate units for measured or calculated values	2, 5			
ix order and sequence objects and/or events				
x classify objects according to an established scheme				17
xi generate a scheme for classification				
xii utilize senses optimally for making observations				
xiii observe, analyze, and report observations of objects and events	3	1, 3	1	
xiv observe, identify, and communicate patterns			2, 3	
xv observe, identify, and communicate cause and effect relationships	3			
xvi generate appropriate questions (teacher and student based) in response to observations, events, and other experiences				
xvii observe, collect, organize, and appropriately record data, then accurately interpret results				
xviii collect and organize data, choosing the appropriate representation: journal entries, graphic representations, drawings/pictorial representations				
xix make predictions based on prior experiences and/or information			2, 3, 5	
xx compare and contrast organisms/objects/events/ in the living and physical environments		2, 4		
xxi identify and control variables/factors			4	
xxii plan, design, and implement a short-term and long-term investigation based on a student- or teacher-posed problem				
xxiii communicate procedures and conclusions through oral and written presentations				

Grade 4 Elementary-Level Science Written Test – May 2004
Reference to Core Curriculum for Individual Test Questions

Question Number	MST Learning Standard	Area within Standard 4 (PS or LE)	Key Idea or Major Understanding	Other Standards, Key Ideas, or Major Understandings	Process Skills Based on Standard 4 (p. 11 in core)
1	4	PS	1.1a		
2	4	PS	2.1c		
3	4	PS	3.2b	3.2a, 3.2c	
4	4	PS	4.1d	3.2b	
5	4	PS	4.1a		
6	4	PS	4.1c	3.1e	
7	4	PS	2.1c		
8	4	PS	2.1c		
9	4	LE	2.1a		
10	4	LE	3.1c	3.1a	
11	4	LE	3.1b		
12	4	LE	3.1b		
13	4	LE	3.1c		
14	4	LE	4.1e		
15	4	LE	5.2c		
16	1	—	S 3.2	M 2.1b; St 4 PS 1.1a, 1.1b	
17	6	—	KI 2	St 4 PS 3.1f	skill x
18	4	PS	2.1b	St 2 KI 1; St 6 KI 2	
19	7	—	KI 1	St 4 PS 3.2b	
20	4	PS	3.1b	3.1c	
21	4	PS	3.1e	3.1c	
22	4	PS	4.1b	4.1d	
23	1	—	M 3.1a	St 4 PS 3.1e	skill vii
24	4	LE	3.1b		
25	4	PS	4.1e	St 6 KI 1 & 2	
26	4	PS	4.1b	4.1a, 4.1c	
27	4	PS	5.1d		
28	4	PS	3.1e	3.1c	skill vi
29	4	LE	5.3a	5.3b	
30	6	—	KI 4	St 4 PS 5.1c, 5.1f	
31	1	—	S 3.2	St 4 LE 4.2b	
32	1	—	S 3.2a	St 4 LE 4.2b	
33	1	—	S 3.2	St 4 LE	
34	4	LE	6.1f	3.2a; St 1 S1.3	
35	4	LE	5.2f	5.2e	
36	4	LE	5.1a	1.1; St 6 KI 2	
37	4	LE	1.1c	5.1; St 6 KI 2	
38	4	LE	6.2a	St 6 KI 2	
39	4	LE	6.2b	St 6 KI 2	
40	4	LE	6.1d	6.1b; St 6 KI 2	
41	4	LE	7.1c	St 6 KI 6	