Item Maps

New York State Grade 8 Intermediate-Level Science Test

June 2004 Written Test
Performance Test Form A

Reference to *Intermediate-Level Science Core Curriculum Grades 5-8*

Reference to Process Skills in core curriculum

(**Note:** core is based on *NYS Learning Standards for Mathematics, Science, and Technology*)

NYS Learning Standards for Mathematics, Science, and Technology **Standard/Area**	***Reference to Intermediate-Level Science Core Curriculum*** **Key Idea or Performance Indicator**	**Performance Test Form A Question Number**			**June 2004 Written Test Question Number**
		Station 1	**Station 2**	**Station 3**	
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.	**1.1** Formulate questions independently with the aid of references appropriate for guiding the search for explanations of everyday observations.	2 3			
	1.2 Construct explanations independently for natural phenomena, especially by proposing preliminary visual models of phenomena.		8	4	52, 53, 61, 62, 64, 75, 76, 77, 78
	1.3 Represent, present, and defend their proposed explanations of everyday observations so that they can be understood and assessed by others.		7 8	5 6	
	1.4 Seek to clarify, to assess critically, and to reconcile with their own thinking the ideas presented by others, including peers, teachers, authors, and scientists.		7		
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.	**2.1** Use conventional techniques and those of their own design to make further observations and refine their explanations, guided by a need for more information.	3 4 5 6		1 2	16, 20, 26, 28, 73
	2.2 Develop, present, and defend formal research proposals for testing their own explanations of common phenomena, including ways of obtaining needed observations and ways of conducting simple controlled experiments.	2 3 4			46, 63
	2.3 Carry out their research proposals, recording observations and measurements (e.g., lab notes, audiotape, computer disk, videotape) to help assess the explanation.	1 3 4	1 2 3	1 2 4	
Standard 1 Scientific Inquiry Key Idea 3 The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.	**3.1** Design charts, tables, graphs and other representations of observations in conventional and creative ways to help them address their research question or hypothesis.	1 3 5	2 8		
	3.2 Interpret the organized data to answer the research question or hypothesis and to gain insight into the problem.	1	4 5 6	4, 5, 6, 7	10, 24, 35, 36
	3.3 Modify their personal understanding of phenomena based on evaluation of their hypothesis.			5	
Standard 1 Mathematical Analysis	**1** Abstraction and symbolic representation are used to communicate mathematically.		3 8		10, 63
	2 Deductive and inductive reasoning are used to reach mathematical conclusions.		4, 5, 6, 7		36, 47
	3 Critical thinking skills are used in the solution of mathematical problems.				29

NYS Learning Standards for Mathematics, Science, and Technology Standard/Area	*Reference to Intermediate-Level Science Core Curriculum* Key Idea or Performance Indicator	Performance Test Form A Question Number			June 2004 Written Test Question Number
		Station 1	Station 2	Station 3	
Standard 1 Engineering Design	**1.1- 1.5** Engineering design is an iterative process involving modeling and optimization to develop technological solutions to problems within given constraints.				
Standard 2 Information Systems	**1.1 - 1.5** Information technology is used to retrieve, process, and communicate information as a tool to enhance learning.				
	2.1 - 2.3 Knowledge of the impacts and limitations of information systems is essential to its effectiveness and ethical use.				
	3.1 - 3.3 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, 27, 30, 42, 64, 65
	2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.				23, 26, 28, 31, 32, 33, 67, 68
	3 Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.				24, 25, 29, 43, 44, 73, 74, 75, 76, 77, 78
	4 Energy exists in many forms, and when these forms change energy is conserved.				34, 35, 36, 37, 38, 39, 41, 43, 44, 61, 62, 63, 66, 69, 70, 71, 72
	5 Energy and matter interact through forces that result in changes in motion.				40, 45, 61
Standard 4 Living Environment	**1** Living things are both similar to and different from each other and from nonliving things.				1, 2, 3, 4, 6, 8, 9, 54, 55, 56,
	2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.				18, 19, 52, 53, 57
	3 Individual organisms and species change over time.				5, 11
	4 The continuity of life is sustained through reproduction and development.				7, 12, 46, 47, 51
	5 Organisms maintain a dynamic equilibrium that sustains life.				13, 14, 50, 58, 59, 60
	6 Plants and animals depend on each other and their physical environment.				15, 21, 22, 48, 49, 50
	7 Human decisions and activities have had a profound impact on the physical and living environment.				10, 17, 20, 37

NYS Learning Standards for Mathematics, Science, and Technology Standard/Area	*Reference to Intermediate-Level Science Core Curriculum* Key Idea or Performance Indicator	Performance Test Form A Question Number			June 2004 Written Test Question Number
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Standard 6 Interconnectedness: Common Themes	Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.				
Standard 6 Systems Thinking	**1.1 – 1.4** 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				
Standard 6 Models	**2.1 – 2.3** Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.	1, 2, 3, 4	3, 8	4	1, 2, 6, 7, 8, 9, 18, 19 23, 27, 30, 33, 34, 38, 39, 41, 43, 45, 51, 54, 56, 65, 66, 67, 68, 69, 70, 71, 72, 74
Standard 6 Magnitude and Scale	**3.1 – 3.2** 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.				
Standard 6 Equilibrium and Stability	**4.1 - 4.2** Equilibrium is a state of stability due either to a lack of change (static equilibrium) or a balance between opposing forces (dynamic equilibrium).				58, 59, 60
Standard 6 Patterns of Change	**5.1 - 5.2** Identifying patterns of change is necessary for making predictions about future behavior and conditions.		3, 4, 5, 6, 7	6	
Standard 6 Optimization	**6.1 - 6.2** In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs.				
Standard 7 Interdisciplinary Problem Solving	**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.				46
	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.				

Intermediate-Level Science Core Curriculum Grades 5-8
Process Skills Based On Standard 4

	Process Skills	Performance Test Form A Question Number			June 2004 Written Test Question Number
		Station 1	Station 2	Station 3	
General Skills	1. follow safety procedures in the classroom and laboratory				
	2. safely and accurately use the following measurement tools: metric ruler, balance, stopwatch, graduated cylinder, thermometer, spring scale, voltmeter		1		29
	3. use appropriate units for measured or calculated values			1, 2, 3	
	4. recognize and analyze patterns and trends		7, 8		
	5. classify objects according to an established scheme and a student-generated scheme				
	6. develop and use a dichotomous key	1 – 5, 9			8, 9
	7. sequence events				
	8. identify cause-and-effect relationships		4, 5, 6	6, 7	
	9. use indicators and interpret results				
Living Environment Skills	1. manipulate a compound microscope to view microscopic objects	6, 8			
	2. determine the size of a microscopic object, using a compound microscope	7			
	3. prepare a wet mount slide				16
	4. use appropriate staining techniques				
	5. design and use a Punnett square or a pedigree chart to predict the probability of certain traits				18, 19
	6. classify living things according to a student-generated scheme and an established scheme	9			
	7. interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web				15, 48, 49, 50
	8. identify pulse points and pulse rates				
	9. identify structure and function relationships in organisms				55, 57
Physical Setting Skills	1. given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map				65
	2. using identification tests and a flow chart, identify mineral samples				
	3. use a diagram of the rock cycle to determine geological processes that led to the formation of a specific rock type				
	4. plot the location of recent earthquake and volcanic activity on a map and identify patterns of distribution				
	5. use a magnetic compass to find cardinal directions				
	6. measure the angular elevation of an object, using appropriate instruments				
	7. generate and interpret field maps including topographic and weather maps				23, 67
	8. predict the characteristics of an air mass based on the origin of the air mass				
	9. measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.				28
	10. determine the density of liquids, and regular- and irregular-shaped solids			3	
	11. determine the volume of a regular- and an irregular-shaped solid, using water displacement				
	12. using the periodic table, identify an element as a metal, nonmetal, or noble gas				
	13. determine the identity of an unknown element, using physical and chemical properties				
	14. using appropriate resources, separate the parts of a mixture				78
	15. determine the electrical conductivity of a material, using a simple circuit				
	16. determine the speed and acceleration of a moving object				

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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
1	6	—	KI 2	LE 1.2f, 1.1c; PS 1.1c	
2	4	LE	1.1d	St 6 KI 2	
3	4	LE	1.2f		
4	4	LE	1.2j		
5	4	LE	3.2b		
6	4	LE	1.2d	LE 1.2f; St 6 KI 2	
7	4	LE	4.3e	St 6 KI 2	
8	6	—	KI 2	LE 1.1h	General Skill 6
9	6	—	KI 2	LE I.1h	General Skill 6
10	1	—	S 3.2h	LE 7.1e; St 1 M 1.1b	
11	4	LE	3.1b	KI 3 Intro	
12	4	LE	4.4d		
13	4	LE	5.1g		
14	4	LE	5.2d		
15	4	LE	6.1b		LE Skill 7
16	1	—	S 2.1d		LE Skill 3
17	4	LE	7.2b		
18	4	LE	2.2b	LE 2.2c; St 6 KI 2	LE Skill 5
19	4	LE	2.2c	LE 2.2b; St 6 KI 2	LE Skill 5
20	4	LE	7.2b	St 1 S 2.1d	
21	4	LE	6.1c		
22	4	LE	6.2b		
23	6	—	KI 2	PS 2.2p	PS Skill 7
24	4	PS	3.1c	St 1 S 3.2h	
25	4	PS	3.3g		
26	4	PS	2.2i	St 1 S 2.1d	
27	4	PS	1.1g	PS 1.1e; St 6 KI 2	
28	1	—	S 2.1d	PS 2.1d	PS Skill 9
29	1	—	M 3.1a	PS 3.1a	General Skill 2
30	4	PS	1.1i	St 6 KI 2	
31	4	PS	2.1e		
32	4	PS	2.2f	PS 2.2c	
33	4	PS	2.1i	St 6 KI 2	
34	4	PS	4.1e	St 6 KI 2	
35	1	—	S 3.2h	PS 4.2e	
36	1	—	M 2.1a	St 1 S 3.2h; PS 4.2e	
37	4	PS	4.5b	LE 7.2d	
38	4	PS	4.4b	St 6 KI 2	

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39	4	PS	4.4c	St 6 KI 2	
40	4	PS	5.2a		
41	4	PS	4.1d	PS 4.2b; St 6 KI 2	
42	4	PS	1.1c		
43	4	PS	4.2c	PS 3.2a; St 1 6 KI 2	
44	4	PS	4.2b	PS 3.2a	
45	4	PS	5.2g	St 6 KI 2	
46	7	—	1.4	St 1 S 2.2d; LE 4.3e	
47	1	—	M 2.1a	LE 4.3e	
48	4	LE	6.1b		LE Skill 7
49	4	LE	6.1a		LE Skill 7
50	4	LE	6.1b	LE 5.1e	LE Skill 7
51	4	LE	4.3d	St 6 KI 2	
52	4	LE	2.1c	St 1 S 1.2	
53	4	LE	2.1e	St 1 S 1.2	
54	4	LE	1.2c	St 6 KI 2	
55	4	LE	1.1f		LE Skill 9
56	4	LE	1.1c	St 6 KI 2	
57	4	LE	2.1a		LE Skill 9
58	4	LE	5.1a	St 6 KI 4	
59	4	LE	5.1a	St 6 KI 4	
60	4	LE	5.1a	St 6 KI 4	
61	4	PS	4.5a	PS 5.2d; St 1 S 1.2	
62	1	—	S 1.2a	PS 4.5a	
63	1	—	S 2.2d	M 1.1a; PS 4.5a	
64	4	PS	1.1h	St 1 S 1.2	
65	4	PS	1.1f	St 6 KI 2	PS Skill 1
66	4	PS	4.4g	St 6 KI 2	
67	4	PS	2.1d	St 6 KI 2	PS Skill 7
68	4	PS	2.1g	PS 2.1i; St 6 KI 2	
69	4	PS	4.1a	St 6 KI 2	
70	4	PS	4.1b	St 6 KI 2	
71	4	PS	4.1b	St 6 KI 2	
72	4	PS	4.1c	St 6 KI 2	
73	4	PS	3.3d	St 1 S 2.1d	
74	4	PS	3.3b	St 6 KI 2	
75	4	PS	3.3b	St 1 S 1.2d	
76	4	PS	3.1h	PS 3.1g, 3.1a; St 1 S 1.2	
77	4	PS	3.1b	PS 3.1g; St 1 S 1.2	
78	4	PS	3.1g	St 1 S 1.2	PS Skill 14