THE UNIVERSITY OF THE STATE OF NEW YORK

GRADE 8

INTERMEDIATE-LEVEL TEST

SCIENCE

JUNE 2003

FOR TEACHERS ONLY

RATING GUIDE FOR WRITTEN TEST, PART II

CONVERSION TABLE

ITEM MAP

This rating guide contains detailed directions for rating student responses to Part II of the written test in Intermediate-Level Science. All raters should become familiar with the detailed directions before beginning to rate student responses.

Appendix A provides a chart that translates final scores into four performance levels. The conversion table that is needed to translate a student's raw scores on the written and performance tests to a final score is also provided.

Appendix B provides several charts that link the individual items on the test to the *Intermediate-Level Science Core Curriculum 5–8.* This core curriculum is based on the *New York State Learning Standards in Mathematics, Science, and Technology.*

Questions regarding this test should be directed to Ann Crotty at (518) 474-5922 or Judy Pinsonnault at (518) 474-5900.

Note: Retain this guide for future use. Do not return it to SED with the performance test materials.

Detailed Directions for Rating Part II of the Written Test

This guide contains detailed directions and criteria for scoring student responses to the questions in Part II of the Written Test. Raters should become familiar with the detailed directions and scoring criteria before beginning to score the student responses.

In rating the student responses, follow the procedure outlined below.

1. Familiarize yourself with the system your school is using for processing the answer papers and recording the test scores. For example, scores may be transferred to each student's scannable answer sheet or to the Class Record Sheet.

2. Have a test booklet on hand. Read each Part II question carefully. Note exactly what is required.

3. Carefully read the criteria provided in this guide for scoring each question. Look at the sample responses for each point value. **Note:** These samples represent actual student responses that have been transcribed.

4. 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. Other responses that convey the same general meaning as those given in this guide should also receive credit. Raters must use their judgement to decide if the student's answer meets the criteria. You may find it helpful to discuss questionable student responses with other raters.

5. Discuss with other raters the requirements of each question and the scoring criteria. When you are certain that you clearly understand the requirements and criteria, you are ready to begin scoring the student responses.

6. It is recommended that you score all the student responses to one question before proceeding to the next question. This method helps ensure that the scoring criteria are applied consistently.

7. Students should *not* lose credit for incorrect spelling, grammar, capitalization, or punctuation.

8. In responses to questions where a specific number of answers are required (e.g., identify three materials, give two examples), if the student provides more than the required number of answers, score only the required number, in the order in which they appear.

9. Record the number of credits you allow for each question in the table provided on the back cover of the test booklet. The maximum number of credits for each question appears in the table.

10. When you have finished scoring all the Part II questions, add the credits allowed for each question to obtain the total raw score for Part II.

11. The total raw score for Part II can be transferred to the student's scannable answer sheet. Check to be certain that the student name on the test booklet matches the name on the answer sheet. Scores may also be transferred to the Class Record Sheet if your school uses it.

12. Add the Student's raw score for Part II to the raw score for Part I to determine the student's total raw score for the written test. Use the conversion table in Appendix A to convert the written and performance test raw scores to a final score for the student.

46 [1] Allow 1 credit for:

The interior is hotter than the crust.
or
The crust is cooler than the interior.

47 [2] Allow a maximum of 2 credits, 1 for each correct geologic feature or event.

Correct answers include:
— earthquakes
— volcanoes
— mountains
— trenches
— ocean basins
— ocean ridge
— island
— rising magma
— faulting
— folding
— Plates move apart.
— New land forms from the lava/magma.
— tsunami

48 [1] Allow 1 credit for:

Oceanic crust is thinner than continental crust.
or
Continental crust is thicker than oceanic crust.

49 [1] Allow 1 credit for a scientifically correct explanation that specifies a direct relationship between the temperature of the water and the amount of solute that will dissolve.

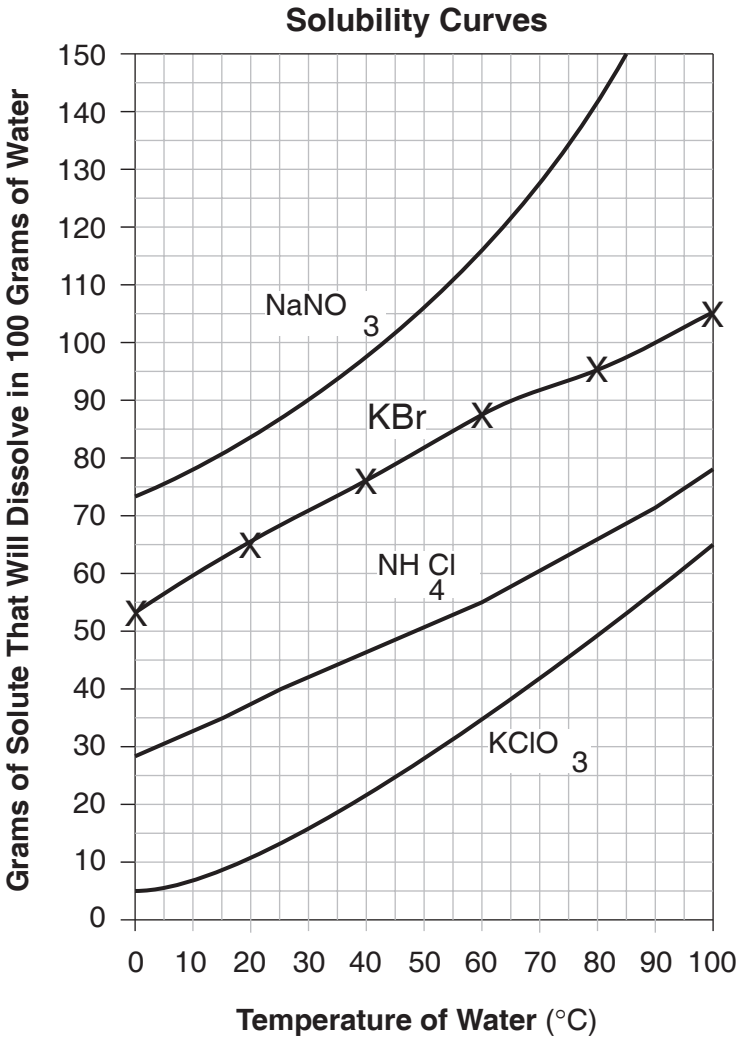
Correct answers include:
— As the temperature increases, the solubility increases.
— As the temperature increases, the amount of solute that dissolves increases.
— As the temperature decreases, the solubility decreases.
— As the temperature decreases, the amount of solid which dissolves decreases.
— There is a direct relationship between temperature and the amount of solute that will dissolve.
— More solute dissolves at higher temperatures.
— Less solute dissolves at lower temperatures.
— a direct relationship
— higher temperature, more dissolves

50 [3] *a* Allow 1 credit if five or six points are correctly plotted ±2 grams.
Note: Allow credit if the points are plotted with dots rather than *X*s.

b Allow 1 credit if the student plotted points are connected with a line.
Note: The line can be point-to point or line of best fit.

c Allow 1 credit if the line is labeled KBr.

Example of a 3-credit graph:



51 [1] Allow 1 credit for indicating that the presence of a major fault line increases the collision of plates in the western part of the United States.

Correct answers include:
— The western portion of the area shown on the map is where tectonic plates meet. This causes many earthquakes.
— Plate collision occurs there.
— There is a boundary between the North Atlantic Plate and the Pacific Plate.
— Faulting in that area causes earthquakes.

52 [2]
- Allow 1 credit for latitude: **40° N** (±3).
- Allow 1 credit for longitude: **110° W** (±3).

Note: Each answer must include value, degree sign, and direction to receive credit.

Allow 1 credit if both sets of values, degree signs, and direction are correct but reversed: Latitude 110° W (±3) Longitude 40° N (±3).

53 [2] Allow a maximum of 2 credits, 1 for each correct emergency action.

Correct answers include:
— Use earthquake-resistant construction.
— Create emergency evacuation plans.
— Locate nearby shelters.
— Keep emergency supplies on hand.
— Develop earthquake education programs.

54 [1] Allow 1 credit for a correct reason that Earth has seasons.

Correct answers include:
— tilt of axis
— revolution
— The axis at points *A*, *B*, *C*, and *D* are parallel.
— rotation

55 [1] Allow 1 credit for any variation of one year.

Correct answers include:

— one year
— 365 days
— 365.25 days
— 365 ¼ days
— 4 seasons
— 12 months

56 [1] Allow 1 credit for **summer**.
Note: Do *not* allow credit for the June, July, or August.

57 [2] Allow 2 credits for four correct answers in the process column.
Allow 1 credit for only two *or* three correct answers in the process column.
Allow 0 credit for only one correct answer or no correct answers.

Correct answers are indicated in the bold in the chart below.
Note: Students must use the terms provided in the question.

Example of a 2- credit chart:

Letter	Process That is Occurring
A	**evaporation**
B	**condensation**
C	**precipitation**
D	**runoff**

58 [2] Allow a maximum of 2 credits, 1 for each method to physically separate the substances.

Correct answers include:
— Use a magnet to pull out the iron filings.
— filtering to remove particles by size
— Dissolve the mixture in a liquid so the salt will dissolve in the water.
— Mix it into a liquid so the substances will settle in layers at the bottom.
Note: Do *not* accept "pick out by hand" unless combined with using a lens or microscope.

59 [3] *a* Allow 1 credit for **A**.

b Allow 1 credit for indicating that there is a relationship between distance and gravity.

Correct answers include:
— As the distance from Earth decreases, the gravitational pull is stronger.
— As the distance from Earth increases, the gravitational pull is weaker.
— *A* is closer, so the gravitational pull is stronger.

c Allow 1 credit for a correct prediction.

Correct answers include:
— It will move to a new orbit.
— It will crash into Earth.
— It will escape from its orbit.

60 [2] • Allow 1 credit for **Tt × Tt.**
• Allow 1 credit for indicating that each of these offspring has a recessive gene for height.

61 [3] Allow a maximum of 3 credits, 1 for each correct plant cell structure. Correct answers are indicated in bold in the chart below.

Plant Cell Structures and Their Functions

Plant Cell Structure	Function
Cell membrane	Allows substances to enter and leave the cell
Nucleus	Directs the cell's activities including reproduction
Chloroplast *or* **Chlorophyll**	Captures energy from sunlight to make food
Cell wall	Protects and supports the cells
Cytoplasm	Allows the movement of materials around the cell and supports other cell structures
Vacuole	Stores food, water, and waste

62 [2] *a* Allow 1 credit for correctly describing a situation that might harm the environment as the company operates the paper plant.

Correct answers include:
— air pollution
— cutting too many trees
— altering the environment
— waste disposal
— water pollution
— animals will die off

b Allow 1 credit for a scientifically correct answer based on the student's response to part *a*.

Correct answers include:
— replant trees
— filter the air
— use recycled paper
— treat wastes
— reduce production

Note: Do *not* accept answers that would still cause damage in another area.
— move to a different area
— get resources somewhere else

63 [1] Allow 1 credit for correctly naming the substances produced by the plant that are harmful to organisms.

Correct answers include:
— pollutant
— toxins
— carcinogens
— pollution
— toxic waste
— biohazards
— poisons
— carbon monoxide
Incorrect answers: chemical, waste product

64 [2] *a* Allow 1 credit for predicting what happened to the rabbit population in 2000.

Correct answers include:

— That there will be fewer than 21 cottontail rabbits.
— The number of rabbits will decrease.
— The rabbit population will die out/be gone.

b Allow 1 credit for a scientifically correct explanation that supports the student's answer in part *a*.

Correct answers include:

— There will be 17 rabbits because every year the rabbit population has been decreasing.
— There will be fewer rabbits because more houses will be built, making less population to live.
— The cottontail rabbit will decrease due to competition for space with humans.
— Each year houses were built which replaced open fields that had served as the rabbits' range. The population will decline due to lack of resources.
— As the amount of space and resources available to the cottontail rabbits decreases, their population will decrease.

65 [1] Allow 1 credit for **B.**

66 [1] Allow 1 credit for naming the process occurring at *C.*

Correct answers include:
— fertilization
— conception
— the sperm enters the egg
Note: Do *not* allow credit for "sexual reproduction," since this term appears in the question.

67 [1] Allow 1 credit for an answer indicating that the offspring contains genetic material from both parents.

Correct answers include:
— The fertilized egg has chromosomes from both the egg and sperm cells.
— There is more genetic material showing in the fertilized egg.
— The four lines at *D* include two from the sperm and two from the egg.

68 [1] Allow 1 credit if for **protein.**

69 [1] Allow 1 credit for **orange juice.**

70 [2] Allow a maximum of 3 credits, 1 for each correct answer. Correct answers are indicated in bold in the chart below.

Rock Type	**Method of Formation**
Igneous	melting and solidification
Sedimentary	deposition, compaction, and cementation
Metamorphic	**— heat and/or pressure** **— metamorphism**

Note: Do *not* accept "magma" for igneous.
Do *not* accept "sediments" for sedimentary.
Do *not* accept "melting" for heat and/or pressure.

Appendix A

New York State Grade 8 Intermediate-Level Science Test
June 2003

Performance Levels Chart

Conversion Table for Determining a Student's Final Test Score
Note: Use for June 2003 test only.

The chart on the next page defines the four performance levels for this test. The state-designated level of performance for this test is a final score of 65 or higher (level 3 and 4). Students scoring below 65 (levels 1 and 2) must be provided with academic intervention services according to section 100.2(ee)(i) of the Regulations of the Commissioner of Education. The chart provides the score intervals and a brief description of student abilities at each level.

The conversion table is presented on the four pages following the performance levels chart. Be sure to use the correct portion of the table. To determine the student's final test score, locate the student's raw score for the performance test across the top of the table and the student's raw score for the written test down the left side of the table. The point where those two scores intersect is the student's final test score. For example, a student receiving a performance test raw score of 32 and a written test raw score of 67 would receive a final test score of 80.

Performance Levels
Grade 8 Intermediate-Level Science Test

Level	Score Range	Description of Student Performance
4	85 – 100	**Meeting the Standards with Distinction** • Student demonstrates superior understanding of the intermediate-level science content and concepts for each of the learning standards and key ideas assessed. • Student demonstrates superior intermediate-level science skills related to each of the learning standards and key ideas assessed. • Student demonstrates superior understanding of the intermediate-level science content, concepts, and skills required for a secondary academic environment.
3	65 – 84	**Meeting the Standards** • Student demonstrates understanding of the intermediate-level science content and concepts for each of the learning standards and key ideas assessed. • Student demonstrates the science skills required for intermediate-level achievement in each of the learning standards and key ideas assessed. • Student demonstrates understanding of the intermediate-level science content, concepts, and skills required for a secondary academic environment.
2	44 – 64	**Not Fully Meeting the Standards** • Student demonstrates only minimal proficiency in intermediate-level science content and concepts in most of learning standards and key ideas assessed. • Student demonstrates only minimal proficiency in the skills required for intermediate-level achievement in most of the learning standards and key ideas assessed. • Student demonstrates marginal understanding of the science content, concepts, and skills required for a secondary academic environment.
1	0 – 43	**Not Meeting the Standards** • Student is *unable* to demonstrate understanding of the intermediate-level science content and concepts in most of the learning standards and key ideas assessed. • Student is *unable* to demonstrate the science skills required for intermediate-level achievement in most of the learning standards and key ideas assessed. • Student is *unable* to demonstrate evidence of the basic science knowledge and skills required for a secondary academic environment.

June 2003 Written Test Raw Score	Performance Test Form A Raw Score																								
	50	**49**	**48**	**47**	**46**	**45**	**44**	**43**	**42**	**41**	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**
86	100	100	99	99	98	98	98	97	97	97	97	97	96	96	96	96	96	96	96	96	95	95	95	95	95
85	99	99	98	98	98	97	97	97	96	96	96	96	96	95	95	95	95	95	95	95	95	94	94	94	94
84	98	98	97	97	97	96	96	96	96	95	95	95	95	95	94	94	94	94	94	94	94	94	94	93	93
83	97	97	97	96	96	96	95	95	95	94	94	94	94	94	94	93	93	93	93	93	93	93	93	93	92
82	97	96	96	95	95	95	94	94	94	94	93	93	93	93	93	93	92	92	92	92	92	92	92	92	92
81	96	95	95	94	94	94	94	93	93	93	93	92	92	92	92	92	92	91	91	91	91	91	91	91	91
80	95	94	94	94	93	93	93	92	92	92	92	91	91	91	91	91	91	91	91	90	90	90	90	90	90
79	94	94	93	93	92	92	92	92	91	91	91	91	90	90	90	90	90	90	90	90	89	89	89	89	89
78	93	93	92	92	92	91	91	91	90	90	90	90	90	89	89	89	89	89	89	89	89	89	88	88	88
77	92	92	91	91	91	90	90	90	90	89	89	89	89	89	88	88	88	88	88	88	88	88	88	87	87
76	92	91	91	90	90	90	89	89	89	88	88	88	88	88	88	87	87	87	87	87	87	87	87	87	86
75	91	90	90	89	89	89	88	88	88	88	87	87	87	87	87	87	86	86	86	86	86	86	86	86	86
74	91	90	90	89	89	89	88	88	88	88	87	87	87	87	87	87	86	86	86	86	86	86	86	86	86
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70	87	87	86	86	86	85	85	85	84	84	84	84	84	84	83	83	83	83	83	83	83	83	82	82	82
69	86	86	86	85	85	84	84	84	84	83	83	83	83	83	83	82	82	82	82	82	82	82	82	81	81
68	86	85	85	84	84	84	83	83	83	83	82	82	82	82	82	82	81	81	81	81	81	81	81	81	81
67	85	84	84	83	83	83	82	82	82	82	81	81	81	81	81	81	81	80	80	80	80	80	80	80	80
66	84	83	83	83	82	82	82	81	81	81	81	80	80	80	80	80	80	80	79	79	79	79	79	79	79
65	83	83	82	82	81	81	81	80	80	80	80	80	79	79	79	79	79	79	79	79	78	78	78	78	78
64	82	82	81	81	81	80	80	80	79	79	79	79	79	78	78	78	78	78	78	78	78	77	77	77	77
63	82	82	81	81	81	80	80	80	79	79	79	79	79	78	78	78	78	78	78	78	78	77	77	77	77
62	81	81	80	80	80	79	79	79	79	78	78	78	78	78	77	77	77	77	77	77	77	77	77	76	76
61	80	80	80	79	79	79	78	78	78	77	77	77	77	77	77	76	76	76	76	76	76	76	76	76	75
60	80	79	79	78	78	78	77	77	77	77	76	76	76	76	76	76	75	75	75	75	75	75	75	75	75
59	79	78	78	77	77	77	77	76	76	76	76	75	75	75	75	75	75	74	74	74	74	74	74	74	74
58	78	77	77	77	76	76	76	75	75	75	75	74	74	74	74	74	74	74	74	73	73	73	73	73	73
57	77	77	76	76	75	75	75	75	74	74	74	74	73	73	73	73	73	73	73	73	72	72	72	72	72
56	76	76	75	75	75	74	74	74	73	73	73	73	73	72	72	72	72	72	72	72	72	72	71	71	71
55	75	75	74	74	74	73	73	73	73	72	72	72	72	72	71	71	71	71	71	71	71	71	71	70	70
54	75	74	74	73	73	73	72	72	72	71	71	71	71	71	71	70	70	70	70	70	70	70	70	70	69
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45	67	66	66	66	65	65	65	64	64	64	64	63	63	63	63	63	63	63	62	62	62	62	62	62	62
44	66	66	65	65	64	64	64	63	63	63	63	63	62	62	62	62	62	62	62	62	61	61	61	61	61

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	50	**49**	**48**	**47**	**46**	**45**	**44**	**43**	**42**	**41**	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**
43	65	65	64	64	64	63	63	63	62	62	62	62	62	61	61	61	61	61	61	61	61	60	60	60	60
42	64	64	63	63	63	62	62	62	62	61	61	61	61	61	60	60	60	60	60	60	60	60	60	59	59
41	63	63	63	62	62	62	61	61	61	60	60	60	60	60	60	59	59	59	59	59	59	59	59	59	58
40	63	62	62	61	61	61	60	60	60	60	59	59	59	59	59	59	58	58	58	58	58	58	58	58	58
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37	60	60	59	59	58	58	58	58	57	57	57	57	56	56	56	56	56	56	56	56	55	55	55	55	55
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16	37	37	36	36	35	35	35	35	34	34	34	34	34	33	33	33	33	33	33	33	33	32	32	32	32
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13	34	33	33	32	32	32	31	31	31	31	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29
12	32	32	31	31	30	30	30	29	29	29	29	29	28	28	28	28	28	28	28	28	27	27	27	27	27
11	31	31	30	30	30	29	29	29	28	28	28	28	28	27	27	27	27	27	27	27	27	26	26	26	26
10	29	29	29	28	28	28	27	27	27	26	26	26	26	26	26	25	25	25	25	25	25	25	25	25	24
9	29	28	28	27	27	27	26	26	26	26	25	25	25	25	25	25	24	24	24	24	24	24	24	24	24
8	27	26	26	26	25	25	25	24	24	24	24	23	23	23	23	23	23	23	23	22	22	22	22	22	22
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6	24	24	23	23	23	22	22	22	22	21	21	21	21	21	20	20	20	20	20	20	20	20	20	19	19
5	23	22	22	21	21	21	20	20	20	20	19	19	19	19	19	19	18	18	18	18	18	18	18	18	18
4	21	20	20	20	19	19	19	18	18	18	18	18	17	17	17	17	17	17	17	16	16	16	16	16	16
3	19	19	18	18	18	17	17	17	16	16	16	16	16	16	15	15	15	15	15	15	15	15	14	14	14
2	18	18	18	17	17	16	16	16	16	15	15	15	15	15	15	14	14	14	14	14	14	14	14	13	13
1	17	16	16	15	15	15	14	14	14	14	13	13	13	13	13	13	13	12	12	12	12	12	12	12	12
0	15	15	14	14	13	13	13	12	12	12	12	12	11	11	11	11	11	11	11	11	10	10	10	10	10

June 2003 Written Test Raw Score	Performance Test Form A Raw Score																									
	25	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
86	95	95	95	94	94	94	94	94	94	93	93	93	92	92	92	91	91	90	90	89	89	88	87	87	86	85
85	94	94	94	94	93	93	93	93	93	92	92	92	92	91	91	90	90	89	89	88	88	87	86	86	85	84
84	93	93	93	93	93	92	92	92	92	92	91	91	91	90	90	90	89	89	88	88	87	86	86	85	84	83
83	92	92	92	92	92	92	91	91	91	91	90	90	90	89	89	89	88	88	87	87	86	85	85	84	83	82
82	91	91	91	91	91	91	91	90	90	90	90	89	89	89	88	88	87	87	86	86	85	85	84	83	82	82
81	91	91	90	90	90	90	90	90	89	89	89	88	88	88	87	87	87	86	86	85	84	84	83	82	82	81
80	90	90	90	89	89	89	89	89	88	88	88	88	87	87	87	86	86	85	85	84	84	83	82	82	81	80
79	89	89	89	89	88	88	88	88	88	87	87	87	86	86	86	85	85	84	84	83	83	82	81	81	80	79
78	88	88	88	88	88	87	87	87	87	86	86	86	86	85	85	84	84	84	83	82	82	81	81	80	79	78
77	87	87	87	87	87	86	86	86	86	86	85	85	85	84	84	84	83	83	82	82	81	80	80	79	78	77
76	86	86	86	86	86	86	85	85	85	85	85	84	84	84	83	83	82	82	81	81	80	80	79	78	77	77
75	86	85	85	85	85	85	85	84	84	84	84	83	83	83	82	82	81	81	80	80	79	79	78	77	76	76
74	86	85	85	85	85	85	85	84	84	84	84	83	83	83	82	82	81	81	80	80	79	79	78	77	76	76
73	85	85	84	84	84	84	84	84	83	83	83	83	82	82	81	81	81	80	80	79	78	78	77	76	76	75
72	84	84	84	83	83	83	83	83	82	82	82	82	81	81	81	80	80	79	79	78	78	77	76	76	75	74
71	83	83	83	83	82	82	82	82	82	81	81	81	80	80	80	79	79	78	78	77	77	76	75	75	74	73
70	82	82	82	82	82	81	81	81	81	81	80	80	80	79	79	79	78	78	77	77	76	75	75	74	73	72
69	81	81	81	81	81	81	80	80	80	80	79	79	79	78	78	78	77	77	76	76	75	74	74	73	72	71
68	80	80	80	80	80	80	80	79	79	79	79	78	78	78	77	77	76	76	75	75	74	74	73	72	71	71
67	80	79	79	79	79	79	79	78	78	78	78	77	77	77	76	76	76	75	75	74	73	73	72	71	71	70
66	79	79	78	78	78	78	78	78	77	77	77	77	76	76	76	75	75	74	74	73	73	72	71	70	70	69
65	78	78	78	77	77	77	77	77	77	76	76	76	75	75	75	74	74	73	73	72	72	71	70	70	69	68
64	77	77	77	77	76	76	76	76	76	75	75	75	75	74	74	73	73	72	72	71	71	70	69	69	68	67
63	77	77	77	77	76	76	76	76	76	75	75	75	75	74	74	73	73	72	72	71	71	70	69	69	68	67
62	76	76	76	76	76	75	75	75	75	75	74	74	74	73	73	73	72	72	71	71	70	69	69	68	67	66
61	75	75	75	75	75	75	74	74	74	74	73	73	73	72	72	72	71	71	70	70	69	68	68	67	66	65
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59	74	74	73	73	73	73	73	73	72	72	72	71	71	71	70	70	70	69	69	68	67	67	66	65	65	64
58	73	73	73	72	72	72	72	72	71	71	71	71	70	70	70	69	69	68	68	67	67	66	65	65	64	63
57	72	72	72	72	71	71	71	71	71	70	70	70	69	69	69	68	68	67	67	66	66	65	64	64	63	62
56	71	71	71	71	71	70	70	70	70	69	69	69	69	68	68	67	67	67	66	65	65	64	64	63	62	61
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51	67	67	67	66	66	66	66	66	65	65	65	65	64	64	64	63	63	62	62	61	61	60	59	59	58	57
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47	63	63	63	63	63	63	63	62	62	62	62	61	61	61	60	60	59	59	58	58	57	57	56	55	54	54
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44	61	61	61	60	60	60	60	60	60	59	59	59	58	58	58	57	57	56	56	55	55	54	53	53	52	51

June 2003 Written Test Raw Score	Performance Test Form A Raw Score																									
	25	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
43	60	60	60	60	59	59	59	59	59	58	58	58	58	57	57	56	56	55	55	54	54	53	52	52	51	50
42	59	59	59	59	59	58	58	58	58	58	57	57	57	56	56	56	55	55	54	54	53	52	52	51	50	49
41	58	58	58	58	58	58	57	57	57	57	56	56	56	55	55	55	54	54	53	53	52	51	51	50	49	48
40	57	57	57	57	57	57	57	56	56	56	56	55	55	55	54	54	53	53	52	52	51	51	50	49	48	48
39	57	57	56	56	56	56	56	56	55	55	55	54	54	54	53	53	53	52	52	51	50	50	49	48	48	47
38	56	56	56	55	55	55	55	55	54	54	54	54	53	53	53	52	52	51	51	50	50	49	48	48	47	46
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36	54	54	54	54	54	53	53	53	53	52	52	52	52	51	51	50	50	50	49	48	48	47	47	46	45	44
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34	52	52	52	52	52	52	51	51	51	51	51	50	50	50	49	49	48	48	47	47	46	46	45	44	43	43
33	52	51	51	51	51	51	51	50	50	50	50	49	49	49	48	48	47	47	46	46	45	45	44	43	42	42
32	50	50	50	49	49	49	49	49	48	48	48	48	47	47	47	46	46	45	45	44	44	43	42	42	41	40
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28	46	46	46	46	46	46	46	45	45	45	45	44	44	44	43	43	42	42	41	41	40	40	39	38	37	37
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25	43	43	43	43	42	42	42	42	42	41	41	41	41	40	40	39	39	38	38	37	37	36	35	35	34	33
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23	40	40	40	40	40	40	40	39	39	39	39	38	38	38	37	37	36	36	35	35	34	34	33	32	31	31
22	40	40	39	39	39	39	39	39	38	38	38	37	37	37	36	36	36	35	35	34	33	33	32	31	31	30
21	39	39	39	38	38	38	38	38	37	37	37	37	36	36	36	35	35	34	34	33	33	32	31	31	30	29
20	37	37	37	37	37	36	36	36	36	35	35	35	35	34	34	33	33	33	32	31	31	30	30	29	28	27
19	36	36	36	36	36	35	35	35	35	35	34	34	34	33	33	33	32	32	31	31	30	29	29	28	27	26
18	35	34	34	34	34	34	34	33	33	33	33	32	32	32	31	31	30	30	29	29	28	28	27	26	25	25
17	34	34	33	33	33	33	33	33	32	32	32	32	31	31	30	30	30	29	29	28	27	27	26	25	25	24
16	32	32	32	32	31	31	31	31	31	30	30	30	29	29	29	28	28	27	27	26	26	25	24	24	23	22
15	31	31	31	31	31	30	30	30	30	30	29	29	29	28	28	28	27	27	26	26	25	24	24	23	22	21
14	30	30	30	30	30	30	29	29	29	29	28	28	28	27	27	27	26	26	25	25	24	23	23	22	21	20
13	29	28	28	28	28	28	28	27	27	27	27	26	26	26	25	25	25	24	24	23	22	22	21	20	20	19
12	27	27	27	26	26	26	26	26	26	25	25	25	24	24	24	23	23	22	22	21	21	20	19	19	18	17
11	26	26	26	26	25	25	25	25	25	24	24	24	24	23	23	22	22	21	21	20	20	19	18	18	17	16
10	24	24	24	24	24	24	23	23	23	23	22	22	22	21	21	21	20	20	19	19	18	17	17	16	15	14
9	23	23	23	23	23	23	23	22	22	22	22	21	21	21	20	20	19	19	18	18	17	17	16	15	14	14
8	22	22	22	21	21	21	21	21	20	20	20	20	19	19	19	18	18	17	17	16	16	15	14	14	13	12
7	20	20	20	20	20	19	19	19	19	18	18	18	18	17	17	16	16	16	15	14	14	13	13	12	11	10
6	19	19	19	19	19	18	18	18	18	18	17	17	17	16	16	16	15	15	14	14	13	12	12	11	10	9
5	18	17	17	17	17	17	17	16	16	16	16	15	15	15	14	14	13	13	12	12	11	11	10	9	8	8
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3	14	14	14	14	14	13	13	13	13	13	12	12	12	11	11	11	10	10	9	9	8	7	7	6	5	4
2	13	13	13	13	13	13	12	12	12	12	11	11	11	10	10	10	9	9	8	8	7	6	6	5	4	3
1	12	11	11	11	11	11	11	10	10	10	10	9	9	9	8	8	8	7	7	6	5	5	4	3	3	2
0	10	10	10	9	9	9	9	9	9	8	8	8	7	7	7	6	6	5	5	4	4	3	2	2	1	0

Appendix B

New York State Grade 8 Intermediate-Level Science Test

June 2003 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**	*NYS Learning Standards for Mathematics, Science, and Technology* **Key Idea**	**Performance Test Form A Item Number**			**June 2003 Written Test Item 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	6, 7, 10
	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	58
	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			
	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		6, 14, 15, 28, 30, 31, 36, 37, 38, 47, 50, 51, 57, 60, 65, 66, 67, 70
	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	1, 19, 49, 61, 68, 69
	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		49, 64
	2 Deductive and inductive reasoning are used to reach mathematical conclusions.		4, 5, 6, 7		1, 64
	3 Critical thinking skills are used in the solution of mathematical problems.				9, 16

NYS Learning Standards for Mathematics, Science, and Technology **Standard/Area**	*NYS Learning Standards for Mathematics, Science, and Technology* **Key Idea**	**Performance Test Form A Item Number**			**June 2003 Written Test Item 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, 2, 52, 54, 55, 56
	2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.				3, 4, 5, 6, 8, 10, 11, 28, 46, 47, 48, 51, 53, 57, 70
	3 Matter is made tip of particles whose properties determine the observable characteristics of matter and its reactivity.				16, 17, 20, 58
	4 Energy exists in many forms, and when these forms change energy is conserved.				7, 12, 13, 14, 19, 20, 21, 22, 46, 49, 50
	5 Energy and matter interact through forces that result in changes in motion.				9, 15, 18, 59, 61
Standard 4 Living Environment	**1** Living things are both similar to and different from each other and from nonliving things.				23, 24, 25, 26, 27, 33, 35, 41, 43, 61
	2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.				39, 60
	3 Individual organisms and species change over time.				28, 32, 42, 64
	4 The continuity of life is sustained through reproduction and development.				29, 34, 40, 65, 66, 67
	5 Organisms maintain a dynamic equilibrium that sustains life.				36, 37, 44, 68, 69
	6 Plants and animals depend on each other and their physical environment.				30, 31
	7 Human decisions and activities have had a profound impact on the physical and living environment.				38, 45, 62, 63

NYS Learning Standards for Mathematics, Science, and Technology **Standard/Area**	*NYS Learning Standards for Mathematics, Science, and Technology* **Key Idea**	**Performance Test Form A Item Number**			**June 2003 Written Test Item Number**
		Station 1	**Station 2**	**Station 3**	
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.				
St 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				
St 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	8, 41, 46, 48, 52, 54, 55, 56, 59, 65, 66, 67
St 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.				19
St 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).				62
St 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	54, 57, 70
St 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.				62
Standard 7 Interdisciplinary PS	**1.1 – 1.4** 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.				53, 62
	2.1 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			June 2003 Written Test Item 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		18
	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			
	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				
	4. use appropriate staining techniques				
	5. design and use a Punnett square or a pedigree chart to predict the probability of certain traits				60
	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				36, 37, 38
	8. identify pulse points and pulse rates				
	9. identify structure and function relationships in organisms				
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				52
	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				10
	8. predict the characteristics of an air mass based on the origin of the air mass				10
	9. measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.				
	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				58
	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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Item #	MST Learning Standard	Area within Standard 4 (PS or LE)	Major Understanding	Other Standards or Understandings	Process Skills Based on Standard 4
1	1	—	M 2.1a, S 3.2h	St 4 PS 1.1e	
2	4	PS	1.1g		
3	4	PS	2.2g		
4	4	PS	2.1d		
5	4	PS	2.2j		
6	4	PS	2.1h	St 1 S 1.2; S 3.1a	
7	4	PS	4.4b	St 1 S 1.2	
8	4	PS	2.2d	St 6 2.1	
9	4	PS	5.1c	St 1 M 3.1	
10	4	PS	2.2m	St 1 S1.2	PS Skill 7&8
11	4	PS	2.2n		
12	4	PS	4.4c		
13	4	PS	4.2b		
14	4	PS	4.4g	St 1 S 3.1a	
15	4	PS	5.2g	St 1 S 3.1a	
16	4	PS	3.3b	St 1 M3.1	
17	4	PS	3.3a		
18	4	PS	5.2a		General Skill 2
19	1	—	S 3.2h	PS 4.4a; St 6 KI 3	
20	4	PS	3.1a	4.2b; 4.4e	
21	4	PS	4.1b		
22	4	PS	4.1c	4.5a	
23	4	LE	1.1b		
24	4	LE	1.1e		
25	4	LE	1.1h		
26	4	LE	1.2d		
27	4	LE	1.2f		
28	4	LE	3.2c	PS 2.1f; St 1 S 3.1a	
29	4	LE	4.3d	4.3c	
30	4	LE	6.2a	6.2c; St 1 S 3.1a	
31	4	LE	6.1a	St 1 S 3.1a	
32	4	LE	3.1c		
33	4	LE	1.2g		
34	4	LE	4.4a		
35	4	LE	1.2h		
36	4	LE	5.1e	St 1 S 3.1a	LE Skill 7
37	4	LE	5.1e	St 1 S 3.1a	LE Skill 7
38	4	LE	7.2a	St 1 S 3.1a	LE Skill 7

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Item #	MST Learning Standard	Area within Standard 4 (PS or LE)	Major Understanding	Other Standards or Understandings	Process Skills Based on Standard 4
39	4	LE	2.1d		
40	4	LE	4.3b		
41	4	LE	1.1d	St 6 KI2	
42	4	LE	3.1a		
43	4	LE	1.2e		
44	4	LE	5.2c		
45	4	LE	7.1a		
46	6	—	2.2	PS 2.2a, 2.2c, 4.2b	
47	4	PS	2.2a	St 1 S 3.1a	
48	6	—	2.2	PS 2.2b	
49	1	—	M 1.1b	St 1 S 3.2h; PS 4.2e	
50	1	—	S 3.1	PS 4.2e	
51	4	PS	2.2f	St 1 S 3.1a	
52	6	—	2	PS 1.1f	PS Skill 1
53	7	—	1.1	PS 2.2f	
54	4	PS	1.1i	St 6 2.2, 5.2	
55	4	PS	1.1h	St 6 2.2	
56	4	PS	1.1i	St 6 2.2	
57	4	PS	2.1j	St 6 KI 5; St 1 S 3.1a	
58	4	PS	3.2b	St 1 S 2.1c	PS Skill 14
59	4	PS	5.2a	St 6 2.2	
60	4	LE	2.2a,b	St 1 S3.1	LE Skill 5
61	4	LE	1.1c	1.1a; St 1 S 3.2h	
62	4	LE	7.2c	7.2d; St 6 KI 6, KI 4.1; St 7 KI 1	
63	4	LE	7.1e		
64	1	—	M 1.1b; M 2.1a	LE 3.2a	
65	4	LE	4.2a	St 6 2.2; St 1 S 3.1a	
66	4	LE	4.2a	St 6 2.2; St 1 S 3.1a	
67	4	LE	4.2b	St 6 2.2; St 1 S 3.1a	
68	4	LE	5.2b	5.2a; St 1 S 3.2h	
69	4	LE	5.2b	5.2a; St 1 S 3.2h	
70	4	PS	2.2g	St 1 S3.1a; St 6 KI 5	