THE UNIVERSITY OF THE STATE OF NEW YORK

GRADE 8

INTERMEDIATE-LEVEL TEST

SCIENCE

JUNE 2004

FOR TEACHERS ONLY

RATING GUIDE FOR WRITTEN TEST, PART II

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 chart 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.*

Any clarifications or changes to this rating guide will be posted on the NYS Education Department website at http://www.emsc.nysed.gov/osa/ at the end of the test administration period. Check this web page before starting the scoring process and several times during the scoring period.

Questions regarding this test should be directed to the Office of Curriculum, Instruction, and Instructional Technology at (518) 474-5922.

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 correctly identifying a variable that should be held constant.

Correct answers include:
— temperature
— amount of sunlight
— amount of water
— same location
— same kind of plant/seed
— grow plants in the same kind of soil

47 [1] Allow 1 credit for any height from 9.0 to 10.0 centimeters.

48 [1] Allow 1 credit for stating how the feeding relationships of the mice are different from the feeding relationships of the other organisms in this food web.

Correct answers include:
— The mouse is an omnivore.
— The mouse eats both plants and meat.
— The mouse is both an herbivore and a carnivore.
— The mouse eats both plants and other animals.
— Mice are primary and secondary consumers.
— The mouse eats both producers and herbivores.

49 [1] Allow 1 credit for explaining the connection between the Sun and the plants.

Correct answers include:
— The Sun is used by plants to make food.
— Green plants use the energy from the Sun to produce sugar, then an herbivore eats the plants, and other animals eat the herbivore.
— The plant uses the Sun's energy to produce food, which it passes on to the animals.
— The carnivores get energy from the herbivores. The herbivores get energy from the plants. The plants get energy from the Sun.
— All animals get energy from plants in some way (by eating plants or by eating other animals that eat plants) and plants get their energy from the Sun.

Note: Do *not* allow credit for "The Sun is our main source of energy," as this is stated in the question.

Incorrect answers include*:*
— The Sun gives the food to the plants.
— The Sun makes the plants.
— The Sun is food for plants.

50 [3] • Allow 1 credit for correctly identifying a carnivore: **frogs** *or* **owls** *or* **snakes**

• Allow 1 credit for correctly identifying a producer: **green plants** *or* **plants** *or* **plant**

• Allow 1 credit for correctly identifying a herbivore: **grasshoppers**

Note: The mice are omnivores. Do *not* allow credit for mice in these categories.

51 [1] Allow 1 credit for correctly describing one difference in the patterns of development.

Correct answers include:
— The grasshopper egg develops into a creature that looks like a small adult, while the adult butterfly looks different from the larva.
— The grasshopper just gets bigger, while the butterfly's appearance changes.
— no larva or pupa in grasshopper
— no nymph in butterfly

52 [1] Allow 1 credit for correctly explaining why the rat was identical to its mother.

Correct answers include:
— Because only the mother's skin cell was used in her egg cell, so the baby rat will only have the mother's genes.
— The egg cell was implanted with a complete set of the mother rat's genes, so an identical baby was produced.
— The baby has the same genes and DNA as the mother.
— The baby rat will be the same because it inherited only its mother's genes.
— It is asexual reproduction, so there is only one parent, so all the baby's genes are identical to the parent.
— was no sperm cell
— Asexual reproduction took place.
— Only the mother's DNA (genes) was used.
— cloning
— It is a cloned baby.
— The skin cell contained all the mother's DNA.

Note: Do *not* accept a simple restatement of the information in the diagram. Answers should indicate that all genetic material comes from the same parent.

53 [1] Allow 1 credit for correctly explaining why the babies will not be genetically identical to the mother.

Correct answers include:
— In sexual reproduction, half of the genes come from each parent.
— Sexually reproduced offspring are not identical to either parent.
— The baby rats will be different because they received both the mother's and father's genes.

54 [2] Allow a maximum of 2 credits, 1 credit for each correct way that food is changed as it passes through the digestive system.

Correct answers include:
— Food is compacted in the large intestine.
— Food is turned into liquid.
— Food decomposes in the stomach.
— Food is mechanically digested in the mouth—it is chewed into small pieces.
— Food is chemically digested in the stomach—acids break the food down into liquid.
— Food is broken down.
— Nutrients are separated from waste materials.
— Saliva in the mouth breaks down carbohydrates.
— Stomach acids break down some food.
— Minerals are separated/absorbed.
— It gets broken up.
— chemical changes
— mechanical changes
— physical changes

Incorrect answers include:
— Food is digested.

55 [3] Allow a maximum of 3 credits, 1 for each correct structure accompanied by a correct function.

Correct answers include:

Letter	Plant Structure	Function of Structure
A	Leaf	— respiration — photosynthesis — produce food — absorbs sunlight — transpiration — storage/stores food
B	Stem	— transport nutrients — support — storage — respiration — transpiration — produce food — photosynthesis
C	Roots	— absorption of nutrients/water — transport — anchors the plant — respiration — storage/stores food

56 [1] Allow 1 credit for correctly naming **both** structures: **chloroplast** and **cell wall**

57 [1] Allow 1 credit for **DNA** *or* **genes** *or* **chromosomes**.

Note: Do *not* allow credit for "genetic material."

58 [1] Allow 1 credit for correctly explaining how blubber helps whales to maintain a constant body temperature.

Correct answers include:
— The blubber acts as a layer of insulation from cold ocean waters, keeping body heat inside.
— The blubber keeps the body warm in cold water.
— The blubber provides fuel to burn for heat and energy.
— acts as an insulator

59 [1] Allow 1 credit for correctly explaining how sweating helps humans to maintain a constant body temperature.

Correct answers include:
— The water in the perspiration cools the body when it evaporates.
— Sweating may release heat.
— When sweat evaporates, it causes a cooling effect.

60 [1] Allow 1 credit for correctly explaining how ear size helps foxes to maintain a constant body temperature.

Correct answers include:
— Because heat is lost from the body through the ears, so the size of the ears affects the amount of heat lost.
— The small surface area of the ears of the arctic fox keep heat from being lost to the cold environment.
— Heat can be lost more easily from the large surface area of the ears of the desert fox.
— The size of the ears determines the amount of heat lost from the body.
— Foxes with small ears will release less body heat and foxes with big ears will release more body heat.

61 [1] Allow 1 credit for correctly explaining that some energy is transformed from mechanical energy to heat energy.

Correct answers include:
— The shaking makes the particles move faster and rub against each other and create heat.
— The grains of sand collide when shaken and cause friction.
— Mechanical energy changed to heat.
— Atoms hitting each other increases motion, therefore heat.
— Shaking created friction between the sand particles.
— friction
— The molecules moving against each other cause friction and this causes heat.

62 [1] Allow 1 credit for an appropriate hypothesis.

Correct answers include:
— The temperature of the pebbles will rise when shaken.
— The temperature of the pebbles will stay the same.
— The temperature of the pebbles will decrease when shaken.
— If you shake a container of pebbles, then the temperature will rise because of friction.

63 [1] Allow 1 credit for correctly identifying the dependent (responding) variable.

Correct answers include:
— temperature
— heat of the pebbles
— making the temperature rise
— making the temperature lower
— the pebbles warming up
— the pebbles cooling down

Note: Do *not* allow credit for "friction." Friction is a force and it is not being measured in this experiment.

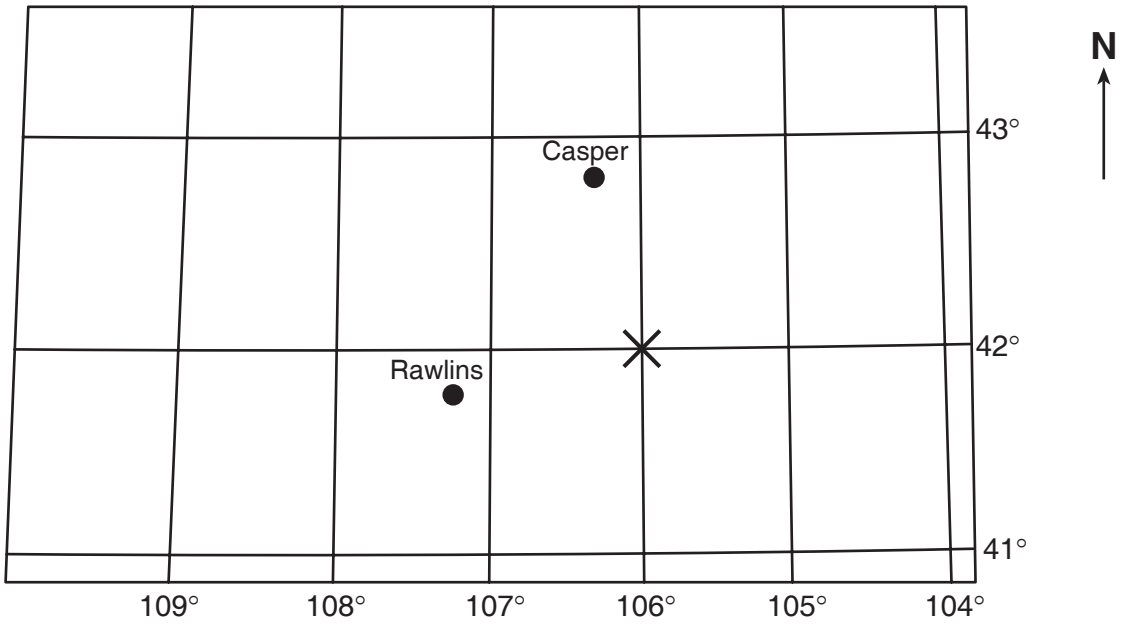
64 [1] Allow 1 credit for correctly explaining why sunrise in Casper, Wyoming, occurs 4 minutes earlier than in Rawlins, Wyoming.

Correct answers include:
— Earth rotates west to east/counterclockwise.
— Casper is located east of Rawlins.
— Earth has to rotate more to receive sunlight.
— Rawlins is west of Casper.
— rotation of Earth
— Casper is 1° east longitude or Rawlins.
— Casper has a lower longitude value.
— Casper is more east than Rawlins and Sun rises in the east.
— Casper is farther east, which is where the Sun rises.
— Because the Earth rotates, so when the Sun rises, Casper will move in front of the Sun before Rawlins.

Incorrect answers include:
— It is farther north.
— because of the tilt of Earth

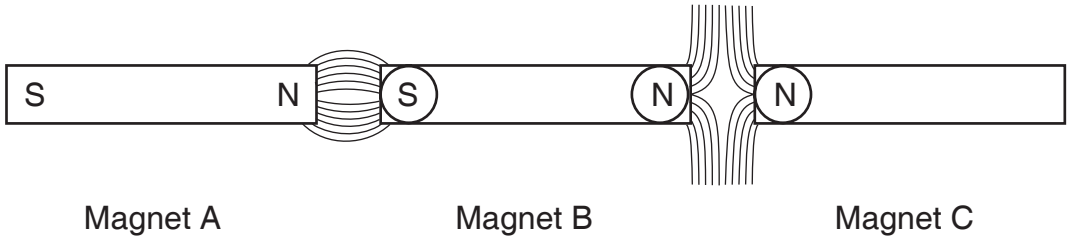
65 [1] Allow 1 credit for correctly placing an **X** on the map, as shown below.

Note: Allow credit if the student uses something other than an **X** as long as the location is shown correctly.



66 [2] *a* Allow 1 credit if all three circled poles are labeled correctly on magnets *B* and *C*.

Example of a correct response:

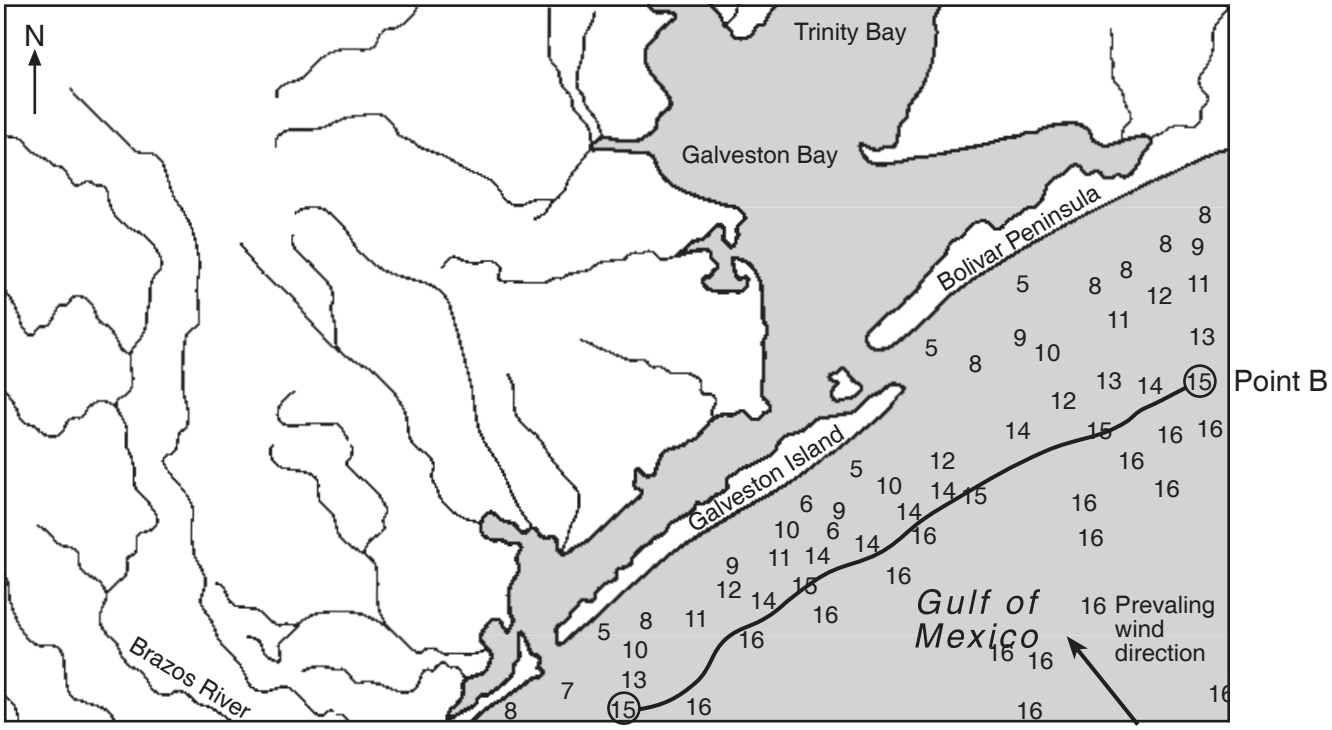


b Allow 1 credit for correctly stating the scientific principle used to label the poles.

Correct answers include:
— Opposite poles attract each other.
— Like poles repel each other.
— North and south poles stick to each other.
— Same poles push away from each other.
— North poles cannot go with north; south cannot go with south.

67 [1] Allow 1 credit for correctly drawing a 15-meter isoline. The line must extend from point *A* to point *B*. It must pass through all 15s and between the 14 and 16 for points where there is no number 15.

Example of a 1-Credit Response



68 [1] Allow 1 credit for a correctly explaining why the gulf sides of the islands have smoother coastlines.

Correct answers include:
— erosion by ocean waves
— wave action
— wind action
— tides
— The waves are constantly hitting the outside edges and that smoothes them out. The inside doesn't have waves, so the edges are rougher.
— Because the gulf water is constantly beating against the coastline, unlike the calmer inland waters.
— The outer coast of the islands are the first thing that the ocean water hits, so the waves smooth them out. The inner coast does not get hit by waves, so it is not as smooth.

69 [1] Allow 1 credit for **Sun** *or* **solar.**

70 [1] Allow 1 credit for correctly identifying one activity in the diagram that requires the use of fossil fuels.

Correct answers include:
— driving cars
— fuel oil heating or cooling the house
— cooking with a gas grill
— fuel-oil truck

71 [1] Allow 1 credit for correctly identifying a renewable resource shown in the diagram.

Correct answers include:
— the Sun (solar)
— trees (wood)
— air (wind)
— water (hydrant or water hose)
— watering the grass

72 [1] Allow 1 credit for correctly describing an energy transformation that occurs as the children play baseball.

Correct answers include:
— chemical energy to mechanical
— mechanical energy to mechanical energy
— potential energy to kinetic energy
— mechanical energy to sound
— kinetic to potential
— chemical to heat
— mechanical to heat
— kinetic to mechanical

Note: Do *not* allow credit for "muscular."

73 [1] Allow 1 credit for correctly stating an observation that would indicate that a chemical reaction is taking place in the test tubes.

Correct answers include:
— formation of bubbles
— A new substance is being formed.
— Gas is being formed.

Note: Do *not* allow credit for "change in temperature" or "heat."

74 [1] Allow 1 credit for correctly stating what effect the temperature of the acid has on the rate of the reaction.

Correct answers include:
— As the temperature increases, the reaction rate increases.
— a direct relationship
— The reaction occurs more slowly at lower temperatures.

75 [2] Allow a maximum of 2 credits, 1 for each correct action the student could take to increase the reaction rate.

Correct answers include:
— Heat the acid.
— Heat the aluminum.
— Use a catalyst.
— Increase the number of collisions (stir or shake the test tube).
— Increase the surface area of the aluminum (cut or chop the pieces).
— change acid
— Increase the concentration of the acid.
— Make the acid stronger.
— Change the metal used in the test tubes.

Incorrect answers include:

— a smaller piece of aluminum
— more acid
— less acid

76 [1] Allow 1 credit for correctly explaining why the oil floats after the stirring stops.

Correct answers include:
— The oil floats because it less dense than water.
— The oil floats because its density is less than 1 g/cm^3.
— The oil floats because its density is less than 1.
— Oil and water have different densities.
— Oil is less dense than the sand.

Incorrect answers include:
— The oil weighs less than the water.
— The oil is lighter than the water.

77 [1] Allow 1 credit for correctly explaining why the salt is no longer visible after the stirring stops.

Correct answers include:
— The salt dissolved in the water.
— Salt is soluble in water.
— The water has absorbed the salt molecules.

Incorrect answers include:
— The salt disintegrated.

78 [1] Allow 1 credit for correctly identifying a way to remove the sand from the mixture in the beaker.

Correct answers include:
— The sand could be removed from the water by filtering.
— The sand could be removed using a strainer/sifter.
— filtering
— sifting
— decanting/pouring off the liquid/drain off the liquid

Incorrect answers include:
— evaporation
— dig/scoop it out by hand

Appendix A

New York State Grade 8 Intermediate-Level Science Test
June 2004

Performance Levels Chart

Conversion Chart for Determining a Student's Final Test Score
Note: Use for June 2004 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.

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.

New York State Grade 8 Intermediate-Level Science Test
June 2004

Conversion Chart for Determining a Student's Final Test Score
Note: Use for June 2004 test only.

The *Conversion Chart for Determining a Student's Final Test Score New York State June 2004 Grade 8 Intermediate-Level Science Test,* normally located on this page, was unavailable at the time of printing. This chart will be posted on the Department's we site: http://www.emsc.nysed.gov/osa by Wednesday, June 2, 2004. Conversion charts provided for previous administrations of the Grade 8 Intermediate-Level Science Test must NOT be used to determine students' final scores for the 2004 administration of the test.

Appendix B

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
		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.				
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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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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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
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