UNIVERSITY OF THE STATE OF NEW YORK

GRADE 8

INTERMEDIATE-LEVEL SCIENCE TEST

JUNE 2017 WRITTEN TEST

FOR TEACHERS ONLY

SCORING KEY AND RATING GUIDE

Note: All schools (public, nonpublic, and charter) administering the Grade 8 Intermediate-Level Science Test are required to make arrangements to obtain answer sheets and associated scanning services from a Regional Information Center (RIC) or a large-city scanning center. These centers will scan and score the answer sheets according to the following criteria:

1. One credit will be awarded for each correct response.
2. Credit will not be allowed if two or more answers have been marked for the same question.
3. The raw score for Part I will be determined by counting the number of correct responses.

For information only, correct responses are listed in the chart below.

Question Number	Correct Response	Question Number	Correct Response	Question Number	Correct Response
1	1	16	2	31	1
2	3	17	4	32	3
3	4	18	1	33	1
4	3	19	3	34	2
5	1	20	2	35	4
6	4	21	3	36	2
7	2	22	1	37	4
8	4	23	1	38	3
9	1	24	4	39	4
10	2	25	3	40	1
11	3	26	4	41	3
12	2	27	2	42	2
13	1	28	4	43	3
14	4	29	2	44	2
15	1	30	3	45	4

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 performance levels chart that translates final scores into four performance levels. A conversion chart is needed to translate a student's raw score on the written and performance tests to a final score. This chart will be posted on the Department's web site http://www.p12.nysed.gov/assessment/ through the "Scoring Information" link. Conversion charts provided for previous administrations of this test must not be used to determine students' final scores for the 2017 administration of this test.

Appendix B provides several charts that link the individual items on the test to the *Intermediate-Level Science Core Curriculum Grades 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 New York State Education Department web site at http://www.p12.nysed.gov/assessment/ during the rating period. Check the "Scoring Information" link at this web site before starting the rating process and several times during the rating period.

Questions regarding this test should be directed to the Office of State Assessment 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

Note: Teachers are not permitted to score their own students' responses.

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 rating criteria before beginning to score the student responses. Refer to the *2017 Manual for Administrators and Teachers* for suggestions about organizing the rating process.

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 student scores.

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.

4. For most questions, examples of acceptable responses are provided. Acceptable responses include, but are not limited to, the examples given. Other responses that convey the same general meaning as those given in this guide should also receive credit. Raters must use their professional judgment to decide if the student's answer meets the criteria. You may find it helpful to discuss questionable student responses with other raters.

5. Acceptable responses separated by a slash (/) are considered to be the same response and should be counted for credit once.

6. To ensure the accuracy of overlays, select a printer setting such as *full*, *actual size*, or *100%* when printing this document. Do ***not*** select the *fit to print* setting.

7. 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.

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

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

10. 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 responses, score only the required number, in the order in which they appear.

11. 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.

12. 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.

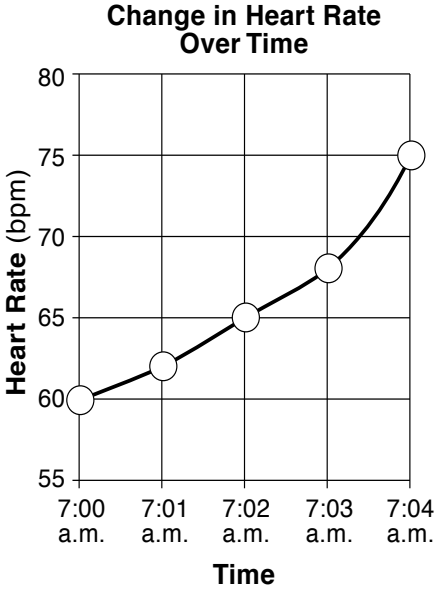
13. Follow your school's procedure for transferring Part II scores to the student's scannable answer sheet. These are local decisions that depend on the answer sheet your school uses. Some schools will transfer a score for each Part II question while others may transfer a total raw score for Part II. Check to be certain that the student name on the test booklet matches the name on the answer sheet.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to http://www.p12.nysed.gov/assessment/teacher/evaluation.html.
2. Select the test title.
3. Complete the required demographic fields.
4. Complete each evaluation question and provide comments in the space provided.
5. Click the SUBMIT button at the bottom of the page to submit the completed form.

46 [1] Allow 1 credit if the centers of *all five* **X**s are within or touch the circles shown and correctly connected with a line that passes within or touches the circles.



Note: Allow credit if a symbol other than an **X** is used to plot the data.
Do *not* allow credit for a bar graph.
Do *not* allow credit if no line is drawn.
It is recommended that an overlay of the same scale as the student test booklet be used to ensure reliability in rating.

47 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The number of bacteria decreased to 0.

— The bacteria treated with antibiotic *B* all died.

— Antibiotic *B* killed all of the bacteria.

— The number of bacteria decreased.

— The line started to rise then fell.

48 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— It is the control in the experiment.

— It is needed to see what happens without treatment.

49 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Find the length, width, and height, and then multiply.

— Calculate the volume by using L × W × H.

— Measure the amount/volume of water displaced.

Note: Allow credit for "s^3" since the block looks like a cube. Do *not* allow credit for "measure length, width, and height" alone as it does not specify multiplication.

50 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— density

— mass

— weight

— It is heavier.

51 [1] Allow 1 credit for 28 grams.

52 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— As temperature increases, solubility increases.

— As the temperature decreases, the amount of salt that can be dissolved decreases.

— a direct relationship

— More salt dissolves as the temperature gets hotter.

53 [1] Allow 1 credit for 0.2 *or* .2 *or* $\frac{1}{5}$ km/min.

Note: Do *not* allow credit for $\frac{6}{30}$ (shows a substitution but not a calculation).

54 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The distance did not change.

— The graph line is horizontal during that time./plateau on graph

— The speed was 0 during interval *D*.

Note: Do *not* allow credit for "it was a straight line" (all intervals are straight lines); "it was constant" (all intervals shown have constant slopes).

55 [1] Allow 1 credit if *all three* process letters are correctly filled in as shown in the table below.

Example of a 1-credit response:

Rock Cycle Statement	Letter of Process from Rock Cycle Diagram
Pieces of igneous rock are compressed and glued together to form a sedimentary rock.	*A*
Metamorphic rock becomes liquid and crystallizes to form igneous rock.	*H*
Sedimentary rock is broken down into sediments and transported by a stream.	*B*

Note: Allow credit if student writes out description of process instead of using the letter.

56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— heating/heat
— pressuring/pressure
— heat and/or pressure
— *C*
— *E*

57 [1] Allow 1 credit for height of seedlings *or* height.

58 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The seedlings that received the most water grew the most.
— The more water the seedlings got, the taller they grew.
— Height increased with more water.
— The seedlings that got less water did not grow as tall.
— direct relationship
— the more water, the faster it grows

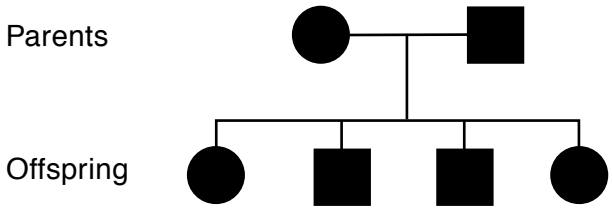
59 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— sunlight/amount of sunlight seedlings are exposed to
— kind of fertilizer given
— air temperature
— water temperature
— amount of soil
— type of soil
— same tool to measure/same ruler
— grown in the same location
— Measure the heights of all the plants at the same time each day.
— same type of water

Note: Do *not* allow credit for water *or* amount of water (Water is the independent variable.).

60 [1] Allow 1 credit if *all four* of the offspring are shaded in.

Example of a 1-credit response:



Key		
Fur color	Male	Female
Black fur	■	●
White fur	□	○

61 [1] Allow 1 credit for two *or* 2 generations.

62 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The pedigree chart shows male/female.
— The pedigree chart shows the number of offspring, whereas the Punnett square only shows probability.

Note: Do *not* allow credit for "phenotype" or "what they look like" because this information can also be inferred from a Punnett square.

63 [1] Allow 1 credit for *two* acceptable answers: marsh grasses/grasses *and* pickerel weeds/weeds.

64 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— There will be more frogs, so they will eat more grasshoppers and there will be fewer grasshoppers to eat the marsh grasses.

— Herons eat frogs, so the population of frogs will increase. Frogs eat grasshoppers, so the population of grasshoppers will decrease. Then there will be fewer grasshoppers to eat the grasses.

Note: Do *not* allow credit for "herons eat frogs, frogs eat grasshoppers" (It only illustrates feeding relationships in the food web, and does not explain how one population may affect the others.).

65 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— provides support

— transports water to the leaves and flowers

— moves nutrients through the plant

— A green stem can carry out photosynthesis/release oxygen.

— storing water

66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The roots might not be able to take in water.

— The damaged roots could not provide support for/anchor the plant.

— The roots will not absorb nutrients.

— The roots might not be able to store food.

67 [1] Allow 1 credit for photosynthesis.

68 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— lowers the amount of sugar in the blood

— removes sugar from the blood

— Insulin stimulates cells to absorb sugar from the blood.

— lowers blood sugar for people with diabetes

Note: Do *not* allow credit for control/regulate blood sugar (both insulin and glucagon regulate blood sugar).

69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The student was eating too much.

— The student had been eating more Calories than he had been burning each day.

— The student was not active enough.

70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Consume fewer Calories.

— Get more exercise/activity.

— Eat less.

— Select lower-Calorie foods.

— Go on a diet.

— Burn the same number of Calories that the student consumes each day.

71 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— fertilization

— The sperm and egg are joining together.

— A zygote is forming.

— conception

72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— mutation

— change in DNA

— change in genetic material

Note: Do *not* allow credit for adaptation/evolution (the trait has not been selected for by nature in the diagram).

73 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— There was increased competition for food and resources.

— They carried a disease that killed Darwin's rats.

— The European rats preyed on the rice rats.

74 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— preserved specimens
— animal remains/skeletons
— photographs or illustrations
— textbooks
— fossils

75 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Monitor the flame at all times.
— Wear safety goggles.
— Point the test tube away from everyone.
— Tie back long hair/loose clothing.
— Wear an apron.
— Wear protective clothing.
— Wear insulated gloves.
— Read and follow directions.
— Do not fool around.

76 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The liquid has changed only its state of matter/phase.
— It is still the same type of matter.
— No new substances have been formed.
— because it's only changing form, not its substance
— The gas is still the same substance, it's only changing its phase.

77 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— wind direction
— prevailing winds
— global wind patterns
— upper air currents/jet stream
— wind

78 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Sunlight could not get through.

— The ash cloud blocked sunlight.

— Some of the Sun's rays were absorbed and/or reflected by the ash particles.

79 [1] Allow 1 credit for *Cynognathus*.

80 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— When South America and Africa are placed together, the fossil locations match.

— The South American fossils are also found in Africa.

— The fossils on the east coast of South America match the fossils on the west coast of Africa.

— Fossils are found on both continents/both locations.

— Fossil locations match up.

Note: Do *not* allow credit for "the continents fit together like a puzzle." (This does not explain fossil evidence.)

81 [1] Allow 1 credit for Cl (chlorine) *and* an acceptable response. Acceptable responses include, but are not limited to:

— Cl is not a noble gas.

— Chlorine is in group 17, not group 18.

— Cl is not in group 18.

— Cl is a nonmetal.

Note: Do *not* allow credit for "Chlorine because it is not a gas." (Cl is not a noble gas, but is a gas at room temperature.)

82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— pollution

— acid rain

— global warming/increased carbon dioxide or other greenhouse gases

— Mining coal can disrupt habitats.

— smoke particles in air

83 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Use less electricity.
— Use a different source of energy.
— Insulate their homes.
— Homeowners could install solar panels.
— Homeowners could install energy-efficient appliances.
— Turn off lights and appliances when not in use.

84 [1] Allow 1 credit for *two* acceptable responses: ultraviolet light (UV) *or* x rays *or* gamma rays.

85 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The Northern Hemisphere is tilted away from the Sun.
— The Sun's direct ray strikes Earth below the equator.
— The South Pole is tilted toward the Sun.
— The Northern Hemisphere is more shaded./has more nighttime than daytime.
— The North Pole is in complete darkness.
— It is tilted away from the Sun.

Note: Do *not* allow credit for:

— The dark side of Earth is not facing the Sun.
(This explains day and night, not seasons.)
— Northern Hemisphere is facing away from the Sun.
(Both hemispheres are facing away.)
— The Northern Hemisphere is farther away from the Sun.
(distance from the Sun does not determine seasons)

Appendix A

New York State Grade 8 Intermediate-Level Science Test
June 2017

Performance Levels Chart

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 (levels 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 chart will be posted on the Department's website http://www.p12.nysed.gov/assessment/ through the "Scoring Information" link.

Note: Conversion charts provided for previous administrations of this test must not be used to determine students' final scores for the 2017 administration.

Performance Levels
Grade 8 Intermediate-Level Science Test

Level	Final Test 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.

Appendix B

Item Maps

New York State Grade 8 Intermediate-Level Science Test
June 2017 Written Test
Performance Test Form A

Item maps contained in this appendix:

- Reference to *Intermediate-Level Science Core Curriculum Grades 5–8* — June 2017 Written Test and Performance Test, Form A
- Reference to Process Skills Based on Standard 4 — June 2017 Written Test and Performance Test, Form A
- Reference to Core Curriculum for Individual Test Questions — June 2017 Written Test
- Reference to Core Curriculum for Individual Test Questions — Performance Test, Form A

Note: Core curriculum 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 2017 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.	**S1.1** Formulate questions independently with the aid of references appropriate for guiding the search for explanations of everyday observations.	2 3			
	S1.2 Construct explanations independently for natural phenomena, especially by proposing preliminary visual models of phenomena.		8	4	45
	S1.3 Represent, present, and defend their proposed explanations of everyday observations so that they can be understood and assessed by others.		7 8	5 6	
	S1.4 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.	**S2.1** 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	75
	S2.2 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			48, 57, 59
	S2.3 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.	**S3.1** 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		46
	S3.2 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	43, 47
	S3.3 Modify their personal understanding of phenomena based on evaluation of their hypothesis.			5	
Standard 1 Mathematical Analysis	**M1** Abstraction and symbolic representation are used to communicate mathematically.		3 8		49, 51, 52, 53, 58
	M2 Deductive and inductive reasoning are used to reach mathematical conclusions.		4, 5, 6, 7		54
	M3 Critical thinking skills are used in the solution of mathematical problems.				44

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 2017 Written Test Question Number
		Station 1	Station 2	Station 3	
Standard 1 Engineering Design	**T 1.1–T 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 The Physical Setting	**1** Earth and celestial phenomena can be described by principles of relative motion and perspective.				23, 26, 27, 79, 85
	2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.				22, 24, 29, 32, 33, 77, 78, 80
	3 Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.				30, 31, 35, 36, 37, 50, 76, 81
	4 Energy exists in many forms, and when these forms change energy is conserved.				25, 38, 39, 40, 41, 42, 83
	5 Energy and matter interact through forces that result in changes in motion.				28, 34
Standard 4 The Living Environment	**1** Living things are both similar to and different from each other and from nonliving things.				1, 2, 3, 4, 5, 6, 7, 17, 63, 65, 66
	2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.				9, 11, 60, 61, 62
	3 Individual organisms and species change over time.				15, 16, 72, 73, 74
	4 The continuity of life is sustained through reproduction and development.				12, 21, 71
	5 Organisms maintain a dynamic equilibrium that sustains life.				8, 13, 14, 18, 69, 70
	6 Plants and animals depend on each other and their physical environment.				67
	7 Human decisions and activities have had a profound impact on the physical and living environment.				10, 19, 20, 82

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 2017 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	55, 56, 64, 68, 84
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).				
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 Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	**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.				
	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 8 Intermediate-Level Science
Reference to Process Skills Based on Standard 4

	Process Skills (From *Intermediate-Level Science Core Curriculum Grades 5–8)*	Performance Test Form A Question Number			June 2017 Written Test Question Number
		Station 1	Station 2	Station 3	
General Skills	1 Follow safety procedures in the classroom and laboratory				75
	2 Safely and accurately use the following measurement tools: metric ruler, balance, stopwatch, graduated cylinder, thermometer, spring scale, voltmeter		1		
	3 Use appropriate units for measured or calculated values			1, 2, 3	
	4 Recognize and analyze patterns and trends		7, 8		47, 52
	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	12, 34, 47, 50, 68, 69, 70, 74, 76, 82, 83
	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, 61, 62
	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				64
	8 Identify pulse points and pulse rates				
	9 Identify structure and function relationships in organisms				6
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				79
	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				55, 56
	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				33
	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.				
	10 Determine the density of liquids, and regular- and irregular-shaped solids			3	50
	11 Determine the volume of a regular- and an irregular-shaped solid, using water displacement				49
	12 Using the periodic table, identify an element as a metal, nonmetal, or noble gas				81
	13 Determine the identity of an unknown element, using physical and chemical properties				
	14 Using appropriate resources, separate the parts of a mixture				
	15 Determine the electrical conductivity of a material, using a simple circuit				
	16 Determine the speed and acceleration of a moving object				

Grade 8 Intermediate-Level Science
Reference to Core Curriculum for Individual Test Questions on Written Test — June 2017

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	4	LE	1.1c		
2	4	LE	1.1b	5.2a	
3	4	LE	1.1d	St 6 KI 2.2	
4	4	LE	1.1e		
5	4	LE	1.2c	St 6 KI 2.2	
6	4	LE	1.2d	1.1g; St 6 KI 2.2	LE 9
7	4	LE	1.2e		
8	4	LE	5.2c		
9	4	LE	2.1d		
10	4	LE	7.2b	St 6 KI 2.2	
11	4	LE	2.1e	2.1a; St 6 KI 2.2	
12	4	LE	4.4d		GS 8
13	4	LE	5.1d		
14	4	LE	5.1e	St 6 KI 2.2	
15	4	LE	3.1b	Intro 3; St 6 KI 2.2	
16	4	LE	3.1b	St 6 KI 2.2	
17	4	LE	1.2j		
18	4	LE	5.2d		
19	4	LE	7.1a		
20	4	LE	7.1c		
21	4	LE	4.3d	St 6 KI 2.2	
22	4	PS	2.2b		
23	4	PS	1.1h		
24	4	PS	2.1e	3.1a	
25	4	PS	4.4b	St 6 KI 2.2	
26	4	PS	1.1g	St 6 KI 2.2	
27	4	PS	1.1g	1.1e; St 6 KI 2.2	
28	4	PS	5.2a		
29	4	PS	2.1c		
30	4	PS	3.2a	2.1j	
31	4	PS	3.3b	St 1 S3.2h	
32	4	PS	2.2q	St 6 KI 2.2	
33	4	PS	2.2q	St 6 KI 2.2	PS 7
34	4	PS	5.2f	5.2g; St 6 KI 2.2	GS 8
35	4	PS	3.1e	St 6 KI 2.2	
36	4	PS	3.1f	3.1c; St 6 KI 2.2	
37	4	PS	3.3f	3.3c; St 6 KI 2.2	
38	4	PS	4.2b		
39	4	PS	4.4b	St 6 KI 2.2	
40	4	PS	4.3a	4.1c	
41	4	PS	4.2d	St 6 KI 2.2	
42	4	PS	4.4g	St 6 KI 2.2	

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
43	1	-	S 3.2h	M 2.1b; PS 1.1e	
44	1	-	M 3.1	S 3.2h; LE 5.2b	
45	1	-	S 1.2c		
46	1	-	S 3.1a	LE 5.1f	
47	1	-	S 3.2h	LE 1.2j	GS 4, 8
48	1	-	S 2.2d	LE 1.2j	
49	1	-	M 1.1c	S 2.1d	PS 11
50	4	PS	3.1h	St 6 KI 2.2	PS 10; GS 8
51	1	-	M 1.1c	PS 3.1b; 4.2e	
52	1	-	M 1.1b	M 2.1b; PS 4.2e	GS 4
53	1	-	M 1.1c	PS 5.1b	
54	1	-	M 2.1b	S 3.2h; PS 5.1b	
55	6	-	KI 2.2	PS 2.2h	PS 3
56	6	-	KI 2.2	PS 2.2h	PS 3
57	1	-	S 2.2d	LE 4.3e	
58	1	-	M1.1b	LE 4.3e	
59	1	-	S 2.2d	LE 4.3e	
60	4	LE	2.2c	St 6 KI 2.2	LE 5
61	4	LE	2.2c	St 6 KI 2.2	LE 5
62	4	LE	2.2c	St 6 KI 2.2, 2.3	LE 5
63	4	LE	1.1h	St 6 KI 2.2	
64	6	-	KI 2.2	LE 6.1b	LE 7
65	4	LE	1.1f	St 6 KI 2.2	
66	4	LE	1.1f	St 6 KI 2.2	
67	4	LE	6.2a	St 6 KI 2.2	
68	6	-	KI 2.2	LE 5.1f; 1.2h	GS 8
69	4	LE	5.2e	St 1 S 3.2h	GS 8
70	4	LE	5.2e	St 1 S 3.2h	GS 8
71	4	LE	4.2a	St 6 KI 2.2	
72	4	LE	3.1a	St 6 KI 2.2	
73	4	LE	3.2b	7.1c; 3.2a; St 1 S1	
74	4	LE	3.2b	PS 2.1f; St 1 S1	GS 8
75	1	-	S 2.1a	St 6 KI 2.2	GS 1
76	4	PS	3.2a	PS 3.2c; St 1 KI 1	GS 8
77	4	PS	2.2r	St 6 KI 2.2	
78	4	PS	2.2r	St 1 S 3.2d	
79	4	PS	1.1f	St 6 KI 2.2	PS 1
80	4	PS	2.2d	St 6 KI 2.2	
81	4	PS	3.3g	St 6 KI 2.2	PS 12
82	4	LE	7.2d	PS 2.2r; St 6 KI 2.2	GS 8
83	4	PS	4.1b	4.4d; St 6 KI 1; St 7 KI 1.1	GS 8
84	6	-	KI 2.2	PS 4.4a	
85	4	PS	1.1i	St 6 KI 2.2	

Grade 8 Intermediate-Level Science
Reference to Core Curriculum for Individual Test Questions on Performance Test Form A

Station	Question Number	Credits	Reference to Grade 8 Intermediate-Level Science Core Curriculum		
			MST Standard 1 (Mathematical Analysis, Scientific Inquiry, and Engineering Design) Key Idea/Performance Indicator	MST Standard 6 Interconnected/ Common Themes	Process Skills Based on MST Standard 4
1	1	3	S 2.3, S 3.1, S 3.2	KI 2	General Skill 6
	2	2	S 1.1, S 2.2	KI 2	General Skill 6
	3	2	S 1.1, S 2.1, S 2.2, S 2.3, S 3.1	KI 2	General Skill 6
	4	2	S 2.1, S 2.2, S 2.3	KI 2	General Skill 6
	5	2	S 2.1, S 3.1		General Skill 6
	6	1	S 2.1		LE Skill 1
	7	1			LE Skill 2
	8	1			LE Skill 1
	9	1			General Skill 6 LE Skill 6
2	1	5	S 2.3		General Skill 2
	2	3	S 2.3, S 3.1		
	3	1	S 2.3 M 1	KI 2 KI 5	
	4	1	S 3.2 M 2	KI 5	General Skill 8
	5	1	S 3.2 M 2	KI 5	General Skill 8
	6	1	S 3.2 M 2	KI 5	General Skill 8
	7	2	S 1.3, S 1.4 M 2	KI 5	General Skill 4
	8	3	S 1.2, S 1.3, S 3.1 M 1	KI 2	General Skill 4
3	1	3	S 2.1, S 2.3		General Skill 3
	2	4	S 2.1, S 2.3		General Skill 3
	3	4			General Skill 3
	4	1	S 1.2, S 2.3, S 3.2	KI 2	
	5	2	S 1.3, S 3.2, S 3.3		
	6	2	S 1.3, S 3.2	KI 5	General Skill 8
	7	2	S 3.2		General Skill 8