THE UNIVERSITY OF THE STATE OF NEW YORK

GRADE 8

INTERMEDIATE-LEVEL SCIENCE TEST

v202

FOR TEACHERS ONLY

RATING GUIDE FOR 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 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 portion 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 2021 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.

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 *2021 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. For questions where there is more than one answer and 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. Sometimes in questions where there is only one acceptable answer, the student will provide more than one answer. These must be considered on a case-by-case basis. If the second answer indicates that the student does not understand the question or is simply guessing, then credit should not be allowed.

12. 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.

13. 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.

14. 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.

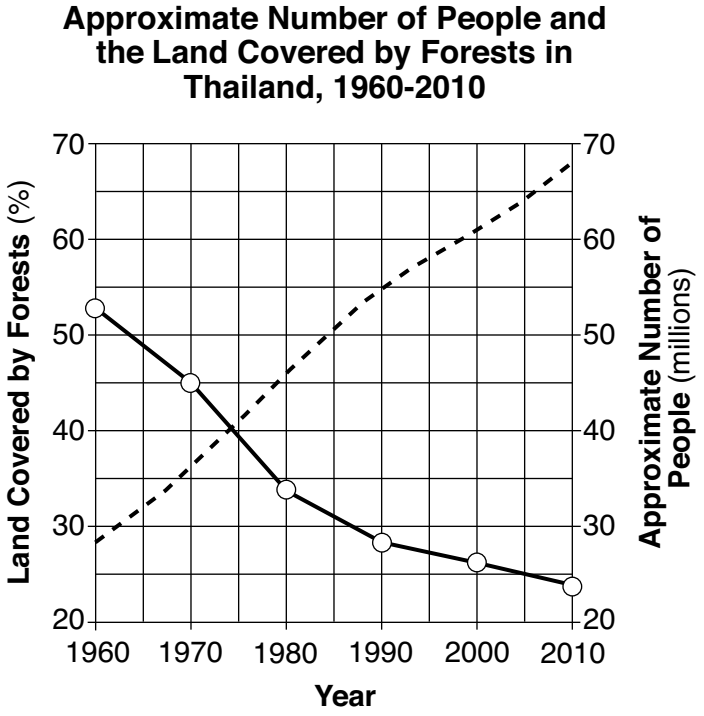
Online Submission of Teacher Evaluations of the Test to the Department

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 six* **X**s are plotted within or touch the circles shown on the graph below and are correctly connected with a line that passes within or touches the circles.

Example of a 1-credit response:



Note: Allow credit if the student uses a symbol other than an **X** to plot the points.

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:

— As the number of people increased, the amount of forest area decreased.

— The more people in Thailand, the fewer forests there are.

— As population goes up, forests go down.

— It's an indirect/inverse relationship.

— negative correlation

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

— habitats for animals

— food for animals

— removal of CO_2 from the atmosphere

— provide O_2 to the environment

— biodiversity

— prevent erosion/flood control

— water purification

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

— same number of seeds
— amount of soil/50 mL of soil
— amount of water/5 mL of water
— clarity of container
— water once a day
— size of container
— shape of container
— material from which the container is made

Note: Do *not* allow credit for "water" alone because it doesn't specify whether the amount of water or the temperature of the water was kept constant.

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

— You can't compare the results because there are two independent (manipulated) variables.
— You can only change one variable at a time.
— The students changed two variables.
— They should have used all bean or all tomato seeds if different water temperatures were used.

51 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— top layer/uppermost layer
— highest rock layer
— the rock layer closest to the surface
— youngest layer

Note: Do *not* allow credit for "first layer" *or* "outer layer" because these could refer to top or bottom.

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

— The area was once covered with water.
— Montana was once under the ocean.

53 [1] Allow 1 credit for *all three* correct answers circled, as shown below.

Description of Change	Cause
A high mountain pond has fewer trout than it had fifty years ago, due to acid rain.	Ecological Succession; Evolution; **Interference by Humans**
The modern horse is much larger than its ancestors that lived thirty-million years ago.	Ecological Succession; **Evolution**; Interference by Humans
A forest now stands where there was once just a grassy field.	**Ecological Succession**; Evolution; Interference by Humans

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

— The student should be wearing goggles.
— Gloves should be worn.
— An apron should be worn.
— A test tube clamp/rack should be used.
— Pour below eye level.
— Have adult supervision/a teacher present.

55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Boil the water away.
— Use the process of filtration with filter paper.
— Allow the water to evaporate.
— Pour it through a sieve/strainer.

56 [1] Allow 1 credit for *both* stomach as the organ *and* digestive as the human body system.

57 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— produces specialized cells/white blood cells

— makes chemicals that identify and destroy infectious diseases

— develops antibodies

— A fever/high temperature may kill off microbes.

— getting rid of the disease in various ways/vomiting/coughing/diarrhea

— Skin prevents disease organisms from entering the body.

— immune system

Note: Do *not* allow credit for artificial interventions taken by a person (e.g., vaccines/antibiotics/vitamins) because these examples are not natural human body responses.

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

— Mayonnaise contains more Calories per serving than ketchup.

— greater number of Calories

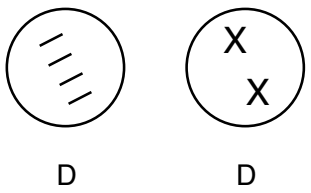
— One tablespoon of mayonnaise has 45 Calories and one tablespoon of ketchup has 20 Calories.

59 [1] Allow 1 credit for 660 mg.

60 [1] Allow 1 credit for sperm *or* male sex cell *or* male gamete.

61 [1] Allow 1 credit for drawing four chromosomes (lines) in circle *D*.

Examples of 1-credit responses are shown below.



Note: Allow credit if the number 4 is used instead of four lines.

62 [1] Allow 1 credit for *two different* acceptable responses. Acceptable responses include, but are not limited to:

— There is only one parent.

— no genetic variation/Offspring are genetically identical to the parent./Parent passes on identical DNA to offspring.

— One parent divides into two offspring.

— The original parent no longer exists after reproduction.

Note: Do *not* allow credit for two similar responses, for example: "asexual has one parent" and "sexual has two parents."

63 [1] Allow 1 credit for heron.

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

— Webbing helps the bird swim.

— Webbed feet help it move faster in the water.

— The webbing provides a wider surface area to keep the bird from sinking in the mud/sand.

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

— Moving around helps the rabbit find food/water.

— Locomotion helps the rabbit find a mate.

— Moving will help the rabbit dig a burrow.

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

— The fur color may become lighter.

— The rabbit may grow thicker fur.

— The rabbit may put on a thicker layer of fat.

— Their metabolism may change.

Note: Do *not* allow credit for hibernation because no species of rabbit is known to hibernate.

67 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Mutations can cause changes in the fur patterns.

— Sexual reproduction allows for variations in the genes of organisms.

— mutation

— They have different genes.

— sexual reproduction

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

— It would be harder to see the cheetahs at these times because they are darker.

— They would be better camouflaged.

— They would blend in better with their environment.

69 [1] Allow 1 credit for any value from 8.0 to 9.0 m.

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

— The car traveled a greater distance each second.

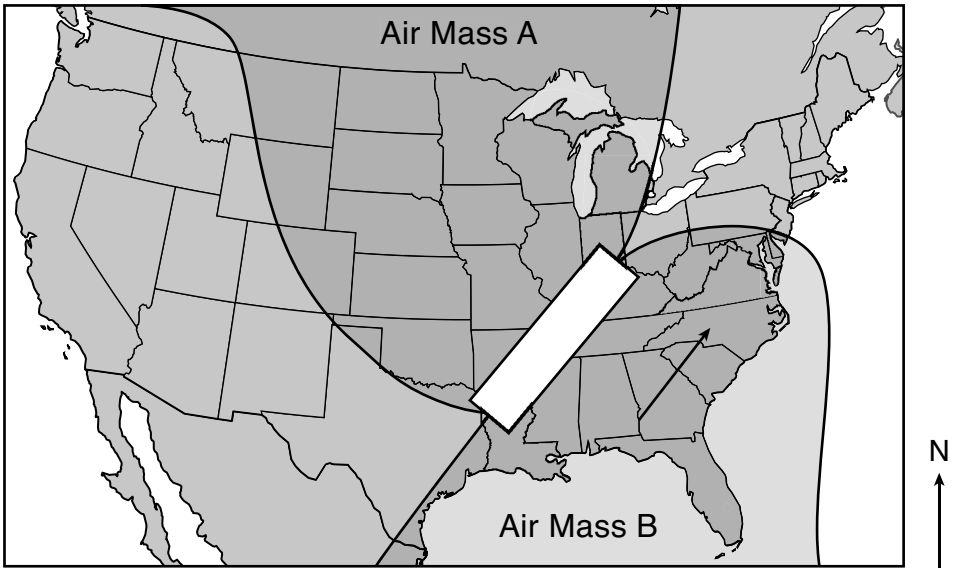
— The diagram shows the car positions getting farther apart.

— The arrows are getting longer.

Note: Do *not* allow credit if the student simply writes "arrows" because they only indicate motion/direction.

71 [1] Allow 1 credit if the center of the **X** is drawn within the boxed area.

Example of a 1-credit response:



Note: It is recommended that an overlay of the same scale as the student test booklet be used to ensure reliability in rating.

72 [1] Allow 1 credit for an arrow drawn inside air mass *B*, pointing in any direction from north to east.

An example of a 1-credit response is shown on the map above.

Note: Allow credit if a correctly drawn arrow extends outside of air mass *B*.

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

— A precipitate/white solid formed.

— A new substance was created.

— New chemicals were formed after the originals were combined together.

— A white, insoluble substance formed.

74 [1] Allow 1 credit for 300 g.

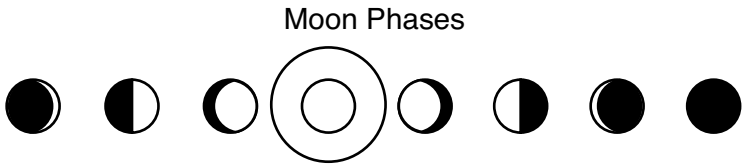
75 [1] Allow 1 credit for *Glossopteris or* land plant.

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

— The continents seem to fit together like pieces of a puzzle.

— The coastlines of South America and Africa fit together.

77 [1] Allow 1 credit for circling the Full Moon phase, as shown below.



78 [1] Allow 1 credit for east/E *or* northeast/NE *or* southeast/SE.

79 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The stars are light-years away from Earth.

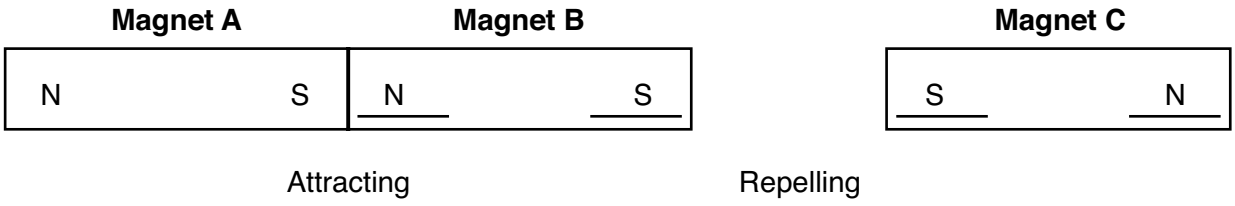
— There is a large distance between Earth and the stars in the constellation Orion.

— Distances between the Sun and other stars are vast.

— The stars are very far away.

80 [1] Allow 1 credit for *Bellatrix*.

81 [1] Allow 1 credit if *all four* student-labeled poles are correct, as shown below.



82 [1] Allow 1 credit for heat *and* pressure.

83 [1] Allow 1 credit for sandstone *or* sedimentary rock.

84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— A black surface will absorb more wavelengths of light.

— A white surface reflects more wavelengths of light.

Note: Do *not* allow credit for the following responses:

Black absorbs more heat. (The black surface absorbs *light/energy*, not heat. The light is converted to heat.)

Black attracts more sunlight. (The black surface *receives* the same amount of sunlight as the white surface.)

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

— less pollution

— Solar energy is renewable.

— conserves fossil fuels

— reduces the need for mining fossil fuels

— Less carbon dioxide is produced.

— reduces global warming

Appendix A

New York State Grade 8 Intermediate-Level Science Test
v202

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 web site 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 2021 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 the 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
v202 Written Test

Item maps contained in this appendix:

- Reference to *Intermediate-Level Science Core Curriculum Grades 5–8* — v202 Written Test
- Reference to Process Skills Based on Standard 4 — v202 Written Test
- Reference to Core Curriculum for Individual Test Questions — v202 Written Test

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**	**v202 Written Test Question Number**
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.	
	S1.2 Construct explanations independently for natural phenomena, especially by proposing preliminary visual models of phenomena.	64, 68
	S1.3 Represent, present, and defend their proposed explanations of everyday observations so that they can be understood and assessed by others.	
	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.	
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.	55
	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.	51
	S2.3 Carry out their research proposals, recording observations and measurements (e.g., lab notes, audiotape, computer disk, videotape) to help assess the explanation.	
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.	46
	S3.2 Interpret the organized data to answer the research question or hypothesis and to gain insight into the problem.	50, 52, 76
	S3.3 Modify their personal understanding of phenomena based on evaluation of their hypothesis.	
Standard 1 Mathematical Analysis	**M1** Abstraction and symbolic representation are used to communicate mathematically.	59
	M2 Deductive and inductive reasoning are used to reach mathematical conclusions.	24, 58, 61
	M3 Critical thinking skills are used in the solution of mathematical problems.	21

NYS Learning Standards for Mathematics, Science, and Technology Standard/Area	*Reference to Intermediate-Level Science Core Curriculum* Key Idea or Performance Indicator	v202 Written Test Question Number
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.	22, 23, 24, 33, 34, 77, 78, 79, 80
	2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.	26, 29, 30, 31, 32, 52, 71, 72, 76, 83
	3 Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.	27, 28, 35, 37, 38, 55, 73, 74
	4 Energy exists in many forms, and when these forms change, energy is conserved.	25, 36, 39, 42, 43
	5 Energy and matter interact through forces that result in changes in motion.	40, 41
Standard 4 The Living Environment	**1** Living things are both similar to and different from each other and from nonliving things.	1, 3, 4, 5, 6, 7, 18, 19, 56, 57, 65
	2 Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.	8
	3 Individual organisms and species change over time.	51, 67
	4 The continuity of life is sustained through reproduction and development.	60, 61, 62
	5 Organisms maintain a dynamic equilibrium that sustains life.	2, 9, 11, 12, 13, 14, 58, 64, 66, 68
	6 Plants and animals depend on each other and their physical environment.	10, 15, 20
	7 Human decisions and activities have had a profound impact on the physical and living environment.	16, 17, 53

NYS Learning Standards for Mathematics, Science, and Technology **Standard/Area**	***Reference to Intermediate-Level Science Core Curriculum*** **Key Idea or Performance Indicator**	**v202 Written Test Question Number**
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.	42, 83
Standard 6 Models	**2.1–2.3** Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.	8, 14, 15, 18, 20, 21, 24, 26, 30, 31, 32, 33, 34, 37, 38, 39, 40, 42, 43, 44, 45, 49, 56, 57, 58, 60, 61, 62, 63, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 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.	72
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.	85
	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)*	v202 Written Test Question Number
General Skills	1 Follow safety procedures in the classroom and laboratory	39, 54
	2 Safely and accurately use the following measurement tools: metric ruler, balance, stopwatch, graduated cylinder, thermometer, spring scale, voltmeter	54
	3 Use appropriate units for measured or calculated values	
	4 Recognize and analyze patterns and trends	30, 34, 47, 51
	5 Classify objects according to an established scheme and a student-generated scheme	
	6 Develop and use a dichotomous key	63
	7 Sequence events	
	8 Identify cause-and-effect relationships	48, 53, 85
	9 Use indicators and interpret results	
Living Environment Skills	1 Manipulate a compound microscope to view microscopic objects	
	2 Determine the size of a microscopic object, using a compound microscope	
	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	
	6 Classify living things according to a student-generated scheme and an established scheme	63
	7 Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web	
	8 Identify pulse points and pulse rates	
	9 Identify structure and function relationships in organisms	64
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	34
	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	82
	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	71
	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	
	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	55
	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 — v202

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	5.1e		
3	4	LE	1.1e		
4	4	LE	1.2c		
5	4	LE	1.2d		
6	4	LE	1.2e		
7	4	LE	1.2h		
8	4	LE	2.1a	St 6 KI 2.2	
9	4	LE	5.2c		
10	4	LE	6.2a		
11	4	LE	5.2a		
12	4	LE	5.2e		
13	4	LE	5.1d		
14	4	LE	5.1e	St 6 KI 2.2	
15	4	LE	6.1a	St 6 KI 2.2	
16	4	LE	5.1d		
17	4	LE	7.1c	St 6 KI 2.2, 3.2a	
18	4	LE	1.1f	St 6 KI 2.2	
19	4	LE	1.1f		
20	4	LE	6.1a	St 6 KI 2.2	
21	1		M2.a/b	PS 1.1c, St.1 M3.1, St 6 KI 2.2	
22	4	PS	1.1e		
23	4	PS	1.1g	1.1e	
24	4	PS	1.1j	St 1 M 2.1, St 6 KI 2.2	
25	4	PS	4.2c		
26	4	PS	2.2b	St 6 KI 2.2	
27	4	PS	3.1a		
28	4	PS	3.3a		
29	4	PS	2.1e		
30	6		2.2a	St 6 KI 2.2	GS 4
31	4	PS	2.2a	2.2e, St 6 KI 2.2	
32	4	PS	2.2f	St 6 KI 2.2	
33	4	PS	1.1f	St 6 KI 2.2	PS 1
34	4	PS	1.1f	St 6 KI 2.2	GS 4, PS 1
35	4	PS	3.1d		
36	4	PS	4.4a		
37	4	PS	3.1f	St 6 KI 2.2	
38	4	PS	3.1c	St 6 KI 2.2	
39	4	PS	4.1e	St 6 KI 2, M2.1b	GS 1
40	4	PS	5.2g	St 6 KI 2.2	
41	4	PS	5.2a		
42	4	PS	4.4e	St 6 KI 2.2, St 6 KI 1.3	

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	4	PS	4.1d	St 6 KI 2.2	
44	1		S 1.2d	St 6 KI 2.2	
45	6		KI 5.2	St 6 KI 2.2	
46	1		S 3.1a		
47	1		M 1.1b		GS 4
48	1		KI 1		GS 8
49	1		S3.2b	St 6 KI 2.2	
50	1		S3.2b		
51	4	LE	3.2c	St 1 S 2.2d	GS 4
52	4	PS	2.1f	St 1 S 3.2d	
53	4	LE	7.2b	7.2d, KI 3 intro	GS 8
54	1		S 2.2a		GS 1, 2
55	4	PS	3.2b	St 1 S 2.1d	PS 14
56	4	LE	1.2c	St 6 KI 2.2	
57	4	LE	1.2j	St 6 KI 2.2	
58	4	LE	5.2d	St 1 M 2.1b, St 6 KI 2.2	
59	1		M 1.1		
60	4	LE	4.2a	St 6 KI 2.2	
61	4	LE	4.2b	St 1 M 2.1b, St 6 KI 2.2	
62	4	LE	4.1a	4.1b, 4.1c, St 6 KI 2.2	
63	1		S 2.1d	St 6 KI 2.2	LE 6, GS 6
64	4	LE	5.1b	St 1 S 1.2	LE 9
65	4	LE	1.2g	St 6 KI 2.2	
66	4	LE	5.1g	St 6 KI 2.2	
67	4	LE	3.1a	St 6 KI 2.2	
68	4	LE	5.1b	St 1 KI 1, St 6 KI 2.2	
69	1		M 2.1b	PS 5.1d, St 6 KI 2.2	
70	6		KI 2.2	PS 5.1d	
71	4	PS	2.2o	St 6 KI 2.2	PS 7
72	4	PS	2.2n	St 6 KI 5.2	
73	4	PS	3.2c	St 6 KI 2.2	
74	4	PS	3.2e	St 6 KI 2.2	
75	6		KI 2.2	PS 2.2d	
76	4	PS	2.2d	St 1 S 3.2d, St 6 KI 2.2	
77	4	PS	1.1g	St 6 KI 2.2	
78	4	PS	1.1h	St 6 KI 2.2	
79	4	PS	1.1b	St 6 KI 2.2	
80	4	PS	1.1b	St 6 KI 2.2	
81	4	PS	4.4g	St 6 KI 2.2	
82	6		KI 2.2	St 6 KI 2.2, PS 2.2h	PS 3
83	4	PS	2.1f	St 6 KI 1	
84	4	PS	4.4b	St 6 KI 2.2	
85	4	PS	4.1b	St 7 KI 1	GS 8