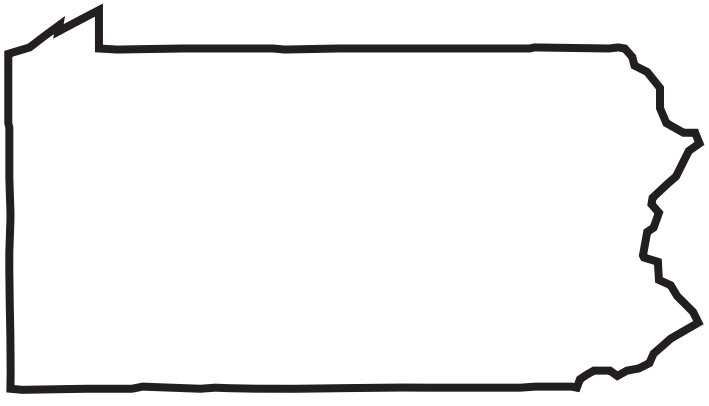
GRADE

4

PSSA Performance Indicator

Science

Form A
Teacher's Guide and Answer Key



Continental Press

Contents

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PSSA Science Performance Indicators

The ***PSSA Science Performance Indicator*** practice tests are designed to help students prepare for the Pennsylvania System of School Assessment (PSSA) in Science. There are two forms of the Performance Indicator available. They are parallel forms that can be administered before instruction and after, or at any time during the school year.

The ***PSSA Finish Line Science, Grade 4*** workbook provides a complete sequence of instruction in the assessed anchors and eligible content. The workbook includes guided practice and independent practice for the assessed science skills and concepts in multiple-choice and open-ended formats. A listing of Assessment Anchors and Eligible Content, as well as Academic Standards, is available at the back of this guide.

The ***PSSA Science Performance Indicators, Grade 4*** are divided into two sessions: Session 1 and Session 2. To emulate the actual testing conditions, the sessions should be administered on the same day. However, if necessary, they may be given on two consecutive days.

Session 1 contains 29 multiple-choice questions and two open-ended items. Multiple-choice questions have four answer choices, one of which is the correct answer. Students should circle the letter of the best answer. Each open-ended question is comprised of two parts, which students must answer in writing. They may be required to read a passage, analyze a table or graph, or make observations about an image.

Session 2 contains 27 multiple-choice questions and three open-ended items.

This teacher's guide includes suggestions for using these test preparation materials, directions for administering the Performance Indicator, and an answer key with correlations to the Pennsylvania Assessment Anchors and Eligible Content for Science for Grade 4 and the Academic Standards for grade 4 for Science and Technology and for Environment and Ecology. It also includes a chart connecting the questions on this performance indicator to the corresponding lesson(s) in the *PSSA Finish Line Science* workbook.

The chart below provides a sample timetable for administering the Grade 4 Performance Indicator.

Session 1	29 multiple-choice questions 2 open-ended questions	50 minutes, plus 10 minutes for preparation
Session 2	27 multiple-choice questions 3 open-ended questions	50 minutes, plus 10 minutes for preparation

Using Your Performance Indicator

Science tests today are usually given in multiple sessions. You will probably want your students to work with the ***PSSA Science Performance Indicator*** practice tests in the same way. In addition, schedule review sessions as close as possible to the completion of the test; this will enable you to go over the students' answers while the contents are still fresh in their minds. Be sure to consider with the students ways in which their written responses could be improved. Directions for using the booklet begin below. Those that you will read aloud to the class are in **boldface type** and preceded by the word **SAY;** those that are not meant to be read aloud are in regular type.

The directions that follow instruct the students to write their answers in the test booklets. If you prefer to use separate answer sheets, reproduce the answer sheets on pages 8 and 9 of this guide. Remind students to write their names on their answer sheets. Then instruct them on how to fill in the circles clearly.

Session 1

Allow 50 minutes for this first session. Make sure each student has a Performance Indicator, Form A, two No. 2 pencils, and optional answer forms, if you are using them.

SAY Turn to the inside front cover of the booklet and write your name on the line provided. You will have 50 minutes to complete Session 1.

Check to be sure students have written their names on the inside front cover of their booklets. Explain to the students that they should read each multiple-choice question and all four answer choices carefully, before marking the best answer. Remind them to write their answers to the open-ended questions neatly. Then take the time to answer any questions the students may have.

SAY Look at page 3 of your booklets.

Read, or have a volunteer read, the directions.

SAY Read the directions and questions on each page carefully. Remember that you have 50 minutes to work on Session 1. Continue working until you reach the word *Stop* on page 19. If you finish early, review your work and just sit quietly until the time is up. Are there any questions?

Pause to answer any questions.

SAY I am now writing the time on the chalkboard. Turn to page 4 and begin.

Check to be sure students have begun working on the booklet correctly. After 40 minutes, alert the students to the time left.

SAY There are 10 minutes left for you to complete Session 1. If you finish page 19 before the time is up, be sure to go back and check your answers.

When time is up, alert the class.

SAY Time's up. Please close your booklets.

Thank the class for their cooperation. Take a short break before beginning Session 2.

Session 2

Allow 50 minutes for the second session. Check that each student has two No. 2 pencils, his or her booklet, and optional answer forms, if you are using them.

SAY **Now you will begin Session 2. You will have 50 minutes to complete this session. Please turn to page 21 and follow along while I read what is on this page.**

Read, or have a volunteer read, the directions.

SAY **Read the directions and questions on each page carefully. Remember that you have 50 minutes to work on Session 2. Continue working until you reach the word *Stop* on page 37. If you finish early, review your work and just sit quietly until the time is up. Are there any questions?**

Pause to answer any questions. Remind the students that you are going to make the session seem as much as possible like the real test they will be taking.

SAY **I am now writing the time on the chalkboard. Turn to page 22 and begin.**

After 40 minutes, alert the students to the time left.

SAY **There are 10 minutes left for you to complete Session 2. If you finish page 37 before the time is up, be sure to go back and check your answers.**

When time is up, alert the class.

SAY **Time's up. Please close your booklets.**

Collect the booklets. Thank the class for their cooperation.

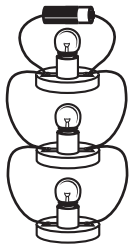
After you check the answers for Sessions 1 and 2 using the answer key on pages 6–7 of this guide, review the responses with students. Continue to work with students to improve all aspects of their science skills.

Answer Key

The first set of brackets following each answer contains the assessment anchor and eligible content addressed. The second set contains the academic standard.

Session 1

1. B [S4.A.1.1.1] [3.2.4.A]
2. B [S4.B.1.1.1] [3.3.4.A]
3. C [S4.C.1.1.1] [3.4.4.A]
4. A [S4.D.1.1.3] [3.5.4.A]
5. D [S4.A.3.3.1] [3.1.4.C]
6. D [S4.A.2.1.1] [3.2.4.C]
7. C [S4.A.2.1.4] [3.2.4.C]
8. A [S4.A.3.1.1] [3.1.4.A]
9. B [S4.B.1.1.2] [3.3.4.A]
10. D [S4.C.2.1.1] [3.4.4.B]
11. C [S4.D.1.1.1] [3.5.4.A]
12. C [S4.A.1.3.2] [3.1.4.E]
13. B [S4.A.2.1.2] [3.2.4.C]
14. A [S4.D.1.2.3] [4.8.4.A]
15. D [S4.A.1.3.5] [4.8.4.C]
16. B [S4.A.2.2.1] [3.7.4.A]
17. Open-ended [S4.A.3.1.4] [4.4.4.C]
    A. *Answers may vary but should say something like the following:* sheep, wool, factory, sweater, store
    B. *Explanations may vary but should say something like the following:* Trucks can be used to help move the wool from a farm to the factories or from the factories to the store.
18. D [S4.A.1.3.3] [3.1.4.E]
19. A [S4.C.2.1.4] [3.4.4.C]
20. C [S4.A.1.3.4] [4.7.4.B]
21. A [S4.A.3.1.2] [4.6.4.A]
22. C [S4.D.1.3.1] [3.5.4.D]
23. B [S4.A.3.2.2] [3.1.4.B]
24. D [S4.B.2.1.2] [4.7.4.B]
25. C [S4.C.3.1.2] [3.4.4.C]
26. B [S4.A.3.1.3] [4.6.4.A]
27. A [S4.D.1.3.3] [4.1.4.A]
28. C [S4.A.3.2.1] [3.1.4.B]
29. A [S4.B.1.1.4] [3.3.4.B]
30. D [S4.A.3.3.2] [3.1.4.C]
31. Open-ended [S4.C.2.1.3] [4.4.4.C]
    A. circuit 1
    B. *Drawings may vary but should show a parallel circuit, for example:*



Session 2

32. D [S4.A.3.1.3] [4.6.4.A]
33. B [S4.B.1.1.3] [3.3.4.A]
34. C [S4.C.1.1.2] [3.4.4.A]
35. D [S4.A.1.3.1] [3.1.4.E]
36. A [S4.A.2.2.1] [3.7.4.A]
37. B [S4.B.2.1.1] [3.3.4.A]
38. D [S4.A.1.1.2] [3.8.4.C]
39. C [S4.D.3.1.1] [3.4.4.D]
40. A [S4.A.2.1.3] [3.2.4.C]
41. Open-ended [S4.B.1.1.5] [3.3.4.A]
    A. *Answers may vary but should say something like the following:* Both life cycles have eggs as the youngest stage.
    B. *Answers may vary but should say something like the following:* The frog goes through more body changes in its life cycle.
42. B [S4.C.2.1.2] [3.4.4.B]
43. C [S4.D.1.3.2] [3.5.4.D]
44. B [S4.B.2.2.1] [3.3.4.C]
45. C [S4.C.2.1.3] [3.4.4.B]
46. D [S4.B.3.2.3] [4.6.4.A]
47. B [S4.A.1.3.5] [4.3.4.B]
48. C [S4.A.3.2.3] [3.1.4.B]
49. A [S4.D.2.1.1] [3.5.4.C]
50. C [S4.A.3.1.4] [4.4.4.C]
51. Open-ended [S4.D.1.3.4] [4.1.4.E]
    A. *Explanations may vary but should say something like the following:* The marsh removes pollutants by filtering the water that flows into the lake.

B. *Explanations may vary but should say something like the following:* Water that overflows from the lake soaks into the marsh and becomes groundwater.

52. D [S4.C.3.1.1] [3.4.4.C]
53. B [S4.A.3.2.1] [3.1.4.B]
54. A [S4.A.1.3.4] [4.7.4.B]
55. B [S4.A.3.3.2] [3.1.4.C]
56. C [S4.B.3.3.3] [4.5.4.A]
57. C [S4.C.3.1.3] [3.4.4.C]
58. B [S4.A.2.1.4] [3.2.4.C]
59. D [S4.D.2.1.3] [3.7.4.B]
60. A [S4.A.3.1.2] [4.6.4.A]

61. Open-ended [S4.A.2.1.2] [3.2.4.C]
    A. *Answers may vary but should say something like the following:* The student should change the amount of fertilizer given to each group of plants.
    B. *Answers may vary but should say something like the following:* The student should keep the amount of water, type of soil, and sunlight the same for all plants. *Note: temperature, type of pot, and type of plant are also possible answers.*

Name _____

Session 1—Answer Sheet

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15	Ⓐ	Ⓑ	Ⓒ	Ⓓ
16	Ⓐ	Ⓑ	Ⓒ	Ⓓ
17	Ⓐ	Ⓑ	Ⓒ	Ⓓ
18	Ⓐ	Ⓑ	Ⓒ	Ⓓ
19	Ⓐ	Ⓑ	Ⓒ	Ⓓ
20	Ⓐ	Ⓑ	Ⓒ	Ⓓ
21	Ⓐ	Ⓑ	Ⓒ	Ⓓ
22	Ⓐ	Ⓑ	Ⓒ	Ⓓ
23	Ⓐ	Ⓑ	Ⓒ	Ⓓ
24	Ⓐ	Ⓑ	Ⓒ	Ⓓ
25	Ⓐ	Ⓑ	Ⓒ	Ⓓ
26	Ⓐ	Ⓑ	Ⓒ	Ⓓ
27	Ⓐ	Ⓑ	Ⓒ	Ⓓ
28	Ⓐ	Ⓑ	Ⓒ	Ⓓ
29	Ⓐ	Ⓑ	Ⓒ	Ⓓ
30	Ⓐ	Ⓑ	Ⓒ	Ⓓ
31	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Session 2—Answer Sheet

32	Ⓐ	Ⓑ	Ⓒ	Ⓓ
33	Ⓐ	Ⓑ	Ⓒ	Ⓓ
34	Ⓐ	Ⓑ	Ⓒ	Ⓓ
35	Ⓐ	Ⓑ	Ⓒ	Ⓓ
36	Ⓐ	Ⓑ	Ⓒ	Ⓓ
37	Ⓐ	Ⓑ	Ⓒ	Ⓓ
38	Ⓐ	Ⓑ	Ⓒ	Ⓓ
39	Ⓐ	Ⓑ	Ⓒ	Ⓓ
40	Ⓐ	Ⓑ	Ⓒ	Ⓓ
41	Ⓐ	Ⓑ	Ⓒ	Ⓓ
42	Ⓐ	Ⓑ	Ⓒ	Ⓓ
43	Ⓐ	Ⓑ	Ⓒ	Ⓓ
44	Ⓐ	Ⓑ	Ⓒ	Ⓓ
45	Ⓐ	Ⓑ	Ⓒ	Ⓓ
46	Ⓐ	Ⓑ	Ⓒ	Ⓓ
47	Ⓐ	Ⓑ	Ⓒ	Ⓓ
48	Ⓐ	Ⓑ	Ⓒ	Ⓓ
49	Ⓐ	Ⓑ	Ⓒ	Ⓓ
50	Ⓐ	Ⓑ	Ⓒ	Ⓓ
51	Ⓐ	Ⓑ	Ⓒ	Ⓓ
52	Ⓐ	Ⓑ	Ⓒ	Ⓓ
53	Ⓐ	Ⓑ	Ⓒ	Ⓓ
54	Ⓐ	Ⓑ	Ⓒ	Ⓓ
55	Ⓐ	Ⓑ	Ⓒ	Ⓓ
56	Ⓐ	Ⓑ	Ⓒ	Ⓓ
57	Ⓐ	Ⓑ	Ⓒ	Ⓓ
58	Ⓐ	Ⓑ	Ⓒ	Ⓓ
59	Ⓐ	Ⓑ	Ⓒ	Ⓓ
60	Ⓐ	Ⓑ	Ⓒ	Ⓓ
61	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Open-Ended Answer Sheet

Name _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Session 1—Answer Sheet, Answer Key

1	Ⓐ	●	Ⓒ	Ⓓ
2	Ⓐ	●	Ⓒ	Ⓓ
3	Ⓐ	Ⓑ	●	Ⓓ
4	●	Ⓑ	Ⓒ	Ⓓ
5	Ⓐ	Ⓑ	Ⓒ	●
6	Ⓐ	Ⓑ	Ⓒ	●
7	Ⓐ	Ⓑ	●	Ⓓ
8	●	Ⓑ	Ⓒ	Ⓓ
9	Ⓐ	●	Ⓒ	Ⓓ
10	Ⓐ	Ⓑ	Ⓒ	●
11	Ⓐ	Ⓑ	●	Ⓓ
12	Ⓐ	Ⓑ	●	Ⓓ
13	Ⓐ	●	Ⓒ	Ⓓ
14	●	Ⓑ	Ⓒ	Ⓓ
15	Ⓐ	Ⓑ	Ⓒ	●
16	Ⓐ	●	Ⓒ	Ⓓ
~~**17**~~	Ⓐ	Ⓑ	Ⓒ	Ⓓ
18	Ⓐ	Ⓑ	Ⓒ	●
19	●	Ⓑ	Ⓒ	Ⓓ
20	Ⓐ	Ⓑ	●	Ⓓ
21	●	Ⓑ	Ⓒ	Ⓓ
22	Ⓐ	Ⓑ	●	Ⓓ
23	Ⓐ	●	Ⓒ	Ⓓ
24	Ⓐ	Ⓑ	Ⓒ	●
25	Ⓐ	Ⓑ	●	Ⓓ
26	Ⓐ	●	Ⓒ	Ⓓ
27	●	Ⓑ	Ⓒ	Ⓓ
28	Ⓐ	Ⓑ	●	Ⓓ
29	●	Ⓑ	Ⓒ	Ⓓ
30	Ⓐ	Ⓑ	Ⓒ	●
~~**31**~~	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Session 2—Answer Sheet, Answer Key

32	Ⓐ	Ⓑ	Ⓒ	●
33	Ⓐ	●	Ⓒ	Ⓓ
34	Ⓐ	Ⓑ	●	Ⓓ
35	Ⓐ	Ⓑ	Ⓒ	●
36	●	Ⓑ	Ⓒ	Ⓓ
37	Ⓐ	●	Ⓒ	Ⓓ
38	Ⓐ	Ⓑ	Ⓒ	●
39	Ⓐ	Ⓑ	●	Ⓓ
40	●	Ⓑ	Ⓒ	Ⓓ
~~**41**~~	Ⓐ	Ⓑ	Ⓒ	Ⓓ
42	Ⓐ	●	Ⓒ	Ⓓ
43	Ⓐ	Ⓑ	●	Ⓓ
44	Ⓐ	●	Ⓒ	Ⓓ
45	Ⓐ	Ⓑ	●	Ⓓ
46	Ⓐ	Ⓑ	Ⓒ	●
47	Ⓐ	●	Ⓒ	Ⓓ
48	Ⓐ	Ⓑ	●	Ⓓ
49	●	Ⓑ	Ⓒ	Ⓓ
50	Ⓐ	Ⓑ	●	Ⓓ
~~**51**~~	Ⓐ	Ⓑ	Ⓒ	Ⓓ
52	Ⓐ	Ⓑ	Ⓒ	●
53	Ⓐ	●	Ⓒ	Ⓓ
54	●	Ⓑ	Ⓒ	Ⓓ
55	Ⓐ	●	Ⓒ	Ⓓ
56	Ⓐ	Ⓑ	●	Ⓓ
57	Ⓐ	Ⓑ	●	Ⓓ
58	Ⓐ	●	Ⓒ	Ⓓ
59	Ⓐ	Ⓑ	Ⓒ	●
60	●	Ⓑ	Ⓒ	Ⓓ
~~**61**~~	Ⓐ	Ⓑ	Ⓒ	Ⓓ

PSSA Science Rubric for Open-Ended Items

Rubrics for the PSSA Science items are specific to the individual problems. The following rubric provides general guidelines for evaluating the open-ended items in ***PSSA Finish Line Science.*** In reviewing student work, tailor the rubric to the assessment anchor and eligible content covered in the item.

Score	Description
2	The student response demonstrates a thorough understanding of the content, concepts, and procedures involved in the specific anchor. The response is clear, complete, and correct. The response may contain a minor error or omission that does not detract from the student's demonstration of a thorough understanding.
1	The student response demonstrates a partial understanding of the content, concepts, and procedures involved in the specific anchor. The response is somewhat correct and may contain some work that is incomplete or unclear.
0	The student response contains insufficient evidence to demonstrate any understanding of the content, concepts, and procedures involved in the specific anchor. The response may show only information copied or paraphrased from the problem.

Pennsylvania Assessment Anchors and Eligible Content

S4.A *The Nature of Science*

Assessment Anchor S4.A.1: Reasoning and Analysis

S4.A.1.1 Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems.

- **S4.A.1.1.1** Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results (e.g., a scientific fact can be supported by making observations).
- **S4.A.1.1.2** Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment.

S4.A.1.3 Recognize and describe change in natural or human-made systems and the possible effect of those changes.

- **S4.A.1.3.1** Observe and record change by using time and measurement.
- **S4.A.1.3.2** Describe relative size, distance, or motion.
- **S4.A.1.3.3** Observe and describe the change to objects caused by temperature change or light.
- **S4.A.1.3.4** Explain what happens to a living organism when its food supply, access to water, shelter, or space is changed (e.g., it might die, migrate, change behavior, eat something else).
- **S4.A.1.3.5** Provide examples, predict, or describe how everyday human activities (e.g., solid waste production, food production and consumption, transportation, water consumption, energy production and use) may change the environment.

Assessment Anchor S4.A.2: Processes, Procedures, and Tools of Scientific Investigations

S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.

- **S4.A.2.1.1** Generate questions about objects, organisms, or events that can be answered through scientific investigations.
- **S4.A.2.1.2** Design and describe an investigation (a fair test) to test one variable.
- **S4.A.2.1.3** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadow, animal migrations, growth of plants), record observations, and then make a prediction based on those observations.
- **S4.A.2.1.4** State a conclusion that is consistent with the information/data.

S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide.

- **S4.A.2.2.1** Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length-ruler, mass-balance scale, volume-beaker, temperature-thermometer; making observations: hand lens, binoculars, telescope).

Assessment Anchor S4.A.3: Systems, Models, and Patterns

S4.A.3.1 Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle).

- **S4.A.3.1.1** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).
- **S4.A.3.1.2** Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium).
- **S4.A.3.1.3** Categorize the parts of an ecosystem as either living or nonliving and describe their roles in the system.

S4.A.3.1.4 Identify the parts of the food and fiber systems as they relate to agricultural products from the source to the consumer.

S4.A.3.2 Use models to illustrate simple concepts and compare the models to what they represent.

S4.A.3.2.1 Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).

S4.A.3.2.2 Use models to make observations to explain how systems work (e.g., water cycle, Sun-Earth-Moon system).

S4.A.3.2.3 Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).

S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.

S4.A.3.3.1 Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).

S4.A.3.3.2 Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases).

S4.B *Biological Sciences*

Assessment Anchor S4.B.1: Structure and Function of Organisms

S4.B.1.1 Identify and describe similarities and differences between living things and their life processes.

S4.B.1.1.1 Identify life processes of living things (e.g., growth, digestion, respiration).

S4.B.1.1.2 Compare similar functions of external characteristics or organisms (e.g., anatomical characteristics: appendages, type of covering, body segments).

S4.B.1.1.3 Describe basic needs of plants and animals (e.g., air, water, food).

S4.B.1.1.4 Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).

S4.B.1.1.5 Describe the life cycles of different organisms (e.g., moth, grasshopper, frog, seed-producing plant).

Assessment Anchor S4.B.2: Continuity of Life

S4.B.2.1 Identify and explain how adaptations help organisms to survive.

S4.B.2.1.1 Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).

S4.B.2.1.2 Explain how specific adaptations can help living organisms survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water).

S4.B.2.2 Identify that characteristics are inherited and, thus, offspring closely resemble their parents.

S4.B.2.2.1 Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring.

Assessment Anchor S4.B.3: Ecological Behavior and Systems

S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction.

S4.B.3.1.1 Describe the living and nonliving components of a local ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park, playground).

S4.B.3.1.2 Describe interactions between living and nonliving components (e.g., plants-water, soil, sunlight, carbon dioxide, temperature; animals-food, water, shelter, oxygen, temperature) of a local ecosystem.

S4.B.3.2 Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.

S4.B.3.2.1 Describe what happens to a living thing when its habitat is changed.

S4.B.3.2.2 Describe and predict how changes in the environment (e.g., fire, pollution, flood, building dams) can affect systems.

S4.B.3.2.3 Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).

S4.B.3.3 Identify and describe human reliance on the environment at the individual or the community level.

S4.B.3.3.1 Identify everyday human activities (e.g., driving, washing, eating, manufacturing, farming) within a community that depend on the natural environment.

S4.B.3.3.2 Describe the human dependence on the food and fiber systems from production to consumption (e.g., food, clothing, shelter, products).

S4.B.3.3.3 Identify biological pests (e.g., fungi-molds; plants-foxtail, purple loosestrife, Eurasian water milfoil; animals-aphids, ticks, zebra mussels, starlings, mice) that compete with humans for resources.

S4.B.3.3.4 Identify major land uses in the urban, suburban, and rural communities (e.g., housing, commercial, recreation).

S4.B.3.3.5 Describe the effects of pollution (e.g., litter) in the community.

S4.C *Physical Sciences*

Assessment Anchor S4.C.1: Structure, Properties, and Interaction of Matter and Energy

S4.C.1.1 Describe observable physical properties of matter.

S4.C.1.1.1 Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter.

S4.C.1.1.2 Categorize/group objects using physical characteristics.

Assessment Anchor S4.C.2: Forms, Sources, Conversion, and Transfer of Energy

S4.C.2.1 Recognize basic energy types and sources, or describe how energy can be changed from one form to another.

S4.C.2.1.1 Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).

S4.C.2.1.2 Describe the flow of energy though an object or system (e.g., feeling radiant heat from a light bulb, eating food to get energy, using a battery to light a bulb or run a fan).

S4.C.2.1.3 Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches.

S4.C.2.1.4 Identify characteristics of sound (e.g., pitch, loudness, reflection).

Assessment Anchor S4.C.3: Principles of Motion and Force

S4.C.3.1 Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.

S4.C.3.1.1 Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

S4.C.3.1.2 Compare the relative movement of objects or describe types of motion that are evident (e.g., bouncing ball, moving in a straight line, back and forth, merry-go-round).

S4.C.3.1.3 Describe the position of an object by locating it relative to another object or a stationary background (e.g., geographic direction, left, up).

S4.D *Earth and Space Sciences*

Assessment Anchor S4.D.1: Earth Features and Processes that Change Earth and Its Resources

S4.D.1.1 Describe basic landforms in Pennsylvania.

- **S4.D.1.1.1** Describe how prominent Earth features in Pennsylvania (e.g., mountains, valleys, caves, sinkholes, lakes, rivers) were formed.
- **S4.D.1.1.2** Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.
- **S4.D.1.1.3** Describe the composition of soil as weathered rock and decomposed organic remains.

S4.D.1.2 Identify the types and uses of Earth's resources.

- **S4.D.1.2.1** Identify products and by-products of plants and animals for human use (e.g., food, clothing, building materials, paper products).
- **S4.D.1.2.2** Identify the types and uses of Earth material for renewable, nonrenewable, and reusable products (e.g., human-made products: concrete, paper, plastics, fabrics).
- **S4.D.1.2.3** Recognize ways that humans benefit from the use of water resources (e.g., agriculture, energy, recreation).

S4.D.1.3 Describe Earth's different sources of water or describe changes in the form of water.

- **S4.D.1.3.1** Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans).
- **S4.D.1.3.2** Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).
- **S4.D.1.3.3** Describe or compare lentic systems (i.e., ponds, lakes, and bays) and lotic systems (i.e., streams, creeks, and rivers).
- **S4.D.1.3.4** Explain the role and relationship of a watershed or a wetland on water sources (e.g., water storage, groundwater recharge, water filtration, water source, water cycle).

Assessment Anchor S4.D.2: Weather, Climate, and Atmospheric Processes

S4.D.2.1 Identify basic weather conditions and how they are measured.

- **S4.D.2.1.1** Identify basic cloud types (i.e., cirrus, cumulus, stratus, and cumulonimbus) and make connections to basic elements of weather (e.g., changes in temperature, precipitation).
- **S4.D.2.1.2** Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction, wind speed, cloud types, precipitation).
- **S4.D.2.1.3** Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure.

Assessment Anchor S4.D.3: Composition and Structure of the Universe

S4.D.3.1 Describe Earth's relationship to the sun and the moon.

- **S4.D.3.1.1** Describe motions of the Sun-Earth-Moon system.
- **S4.D.3.1.2** Explain how the motion of the Sun-Earth-Moon system relates to time (e.g., days, months, years).
- **S4.D.3.1.3** Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis.

Academic Standards for Science and Technology

3.1 *Unifying Themes*

4.A Know that natural and human-made objects are made up of parts.
- Identify and describe what parts make up a system.
- Identify system parts that are natural and human-made (e.g., ballpoint pen, simple electrical circuits, plant anatomy).
- Describe the purpose of analyzing systems.
- Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems, and biochemical-related systems.

4.B Know models as useful simplifications of objects or processes.
- Identify different types of models.
- Identify and apply models as tools for prediction and insight.
- Apply appropriate simple modeling tools and techniques.
- Identify theories that serve as models (e.g., molecules).

4.C Illustrate patterns that regularly occur and reoccur in nature.
- Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, structural patterns in bird feathers).
- Use knowledge of natural patterns to predict next occurrences (e.g., seasons, leaf patterns, lunar phases).

4.D Know that scale is an important attribute of natural and human-made objects, events, and phenomena.
- Identify the use of scale as it relates to the measurement of distance, volume, and mass.
- Describe scale as a ratio (e.g., map scales).
- Explain the importance of scale in producing models and apply it to a model.

4.E Recognize change in natural and physical systems.
- Recognize change as fundamental to science and technology concepts.
- Examine and explain change by using time and measurement.
- Describe relative motion.
- Describe the change to objects caused by heat, cold, light, or chemicals.

3.2 *Inquiry and Design*

4.A Identify and use the nature of scientific and technological knowledge.
- Distinguish between scientific fact and a belief.
- Provide clear explanations that account for observations and results.
- Relate how new information can change existing perceptions.

4.B Describe objects in the world using the five senses.
- Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough).
- Use observations to develop a descriptive vocabulary.

4.C Recognize and use the elements of scientific inquiry to solve problems.
- Generate questions about objects, organisms, and/or events that can be answered through scientific investigations.
- Design an investigation.
- Conduct an experiment.
- State a conclusion that is consistent with the information.

4.D Recognize and use the technological design process to solve problems.
- Recognize and explain basic problems.
- Identify possible solutions and their course of action.
- Try a solution.

- Describe the solution, identify its impacts, and modify, if necessary.
- Show the steps taken and the results.

3.3 *Biological Sciences*

4.A Know the similarities and differences of living things.
- Identify life processes of living things (e.g., growth, digestion, or reaction to environment).
- Know that some organisms have similar external characteristics (e.g., anatomical characteristics: appendages, type of covering, body segments) and that similarities and differences are related to environmental habitat.
- Describe basic needs of plants and animals.

4.B Know that living things are made up of parts that have specific functions.
- Identify examples of unicellular and multicellular organisms.
- Determine how different parts of a living thing work together to make the organism function.

4.C Know that characteristics are inherited and, thus, offspring closely resemble their parents.
- Identify characteristics for animal and plant survival in different climates.
- Identify physical characteristics that appear in both parents and offspring and differ between families, strains, or species.

4.D Identify changes in living things over time.
- Compare extinct life forms with living organisms.

3.4 *Physical Science, Chemistry, and Physics*

4.A Recognize basic concepts about the structure and properties of matter.
- Describe properties of matter (e.g., hardness, reactions to simple chemical tests).
- Know that combining two or more substances can make new materials with different properties.
- Know different material characteristics (e.g., texture, state of matter, solubility).

4.B Know basic energy types, sources, and conversions.
- Identify energy forms and examples (e.g., sunlight, heat, stored, motion).
- Know the concept of the flow of energy by measuring flow through an object or system.
- Describe static electricity in terms of attraction, repulsion, and sparks.
- Apply knowledge of the basic electrical circuits to design and construct simple direct current circuits.
- Classify materials as conductors and nonconductors.
- Know and demonstrate the basic properties of heat by producing it in a variety of ways.
- Know the characteristics of light (e.g., reflection, refraction, absorption) and use them to produce heat, color, or a virtual image.

4.C Observe and describe different types of force and motion.
- Identify characteristics of sound (pitch, loudness, and echoes).
- Recognize forces that attract or repel other objects and demonstrate them.
- Describe various types of motion.
- Compare the relative movement of objects and describe types of motion that are evident.
- Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up).

4.D Describe the composition and structure of the universe and Earth's place in it.
- Recognize Earth's place in the solar system.
- Explain and illustrate the causes of seasonal changes.
- Identify planets in our solar system and their general characteristics.
- Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases, and eclipses.

3.5 *Earth Sciences*

4.A Know basic landforms and earth history.
- Describe earth processes (e.g., rusting, weathering, erosion) that have affected selected physical features in students' neighborhoods.
- Identify various earth structures (e.g., mountains, faults, drainage basins) through the use of models.
- Identify the composition of soil as weathered rock and decomposed organic remains.
- Describe fossils and the type of environment they lived in (e.g., tropical, aquatic, desert).

4.B Know types and uses of earth materials.
- Identify uses of various earth materials (e.g., buildings, highways, fuels, growing plants).
- Identify and sort earth materials according to a classification key (e.g., soil/rock type).

4.C Know basic weather elements.
- Identify cloud types.
- Identify weather patterns from data charts (including temperature, wind direction and speed, precipitation) and graphs of the data.
- Explain how the different seasons affect plants, animals, food availability, and daily human life.

4.D Recognize the earth's different water resources.
- Know that approximately three-fourths of the earth is covered by water.
- Identify and describe types of fresh and salt-water bodies.
- Identify examples of water in the form of solid, liquid, and gas on or near the surface of the earth.
- Explain and illustrate evaporation and condensation.
- Recognize other resources available from water (e.g., energy, transportation, minerals, food).

3.6 *Technology Education*

4.A Know that biotechnologies relate to propagating, growing, maintaining, adapting, treating, and converting.
- Identify agricultural and industrial production processes that involve plants and animals.
- Identify waste management treatment processes.
- Describe how knowledge of the human body influences or impacts ergonomic design.
- Describe how biotechnology has impacted various aspects of daily life (e.g., health care, agriculture, waste treatment).

4.B Know that information technologies involve encoding, transmitting, receiving, storing, retrieving, and decoding.
- Identify electronic communication methods that exist in the community (e.g., digital cameras, telephone, the Internet, television, fiber optics).
- Describe appropriate image generating techniques (e.g., photography, video).
- Demonstrate the ability to communicate an idea by applying basic sketching and drawing techniques.

4.C Know physical technologies of structural design, analysis and engineering, finance, production, marketing, research, and design.
- Identify and group a variety of construction tasks.
- Identify the major construction systems present in a specific local building.
- Identify specific construction systems that depend on each other in order to complete a project.
- Know skills used in construction systems that depend on each other in order to complete a project.
- Know skills used in construction.
- Identify examples of manufactured goods present in the home and school.
- Identify waste and pollution resulting from a manufacturing enterprise.
- Explain and demonstrate the concept of manufacturing (e.g., assemble a set of papers or ballpoint pens sequentially, mass produce an object).
- Identify transportation technologies of propelling, structuring, suspending, guiding, controlling, and supporting.

- Identify and experiment with simple machines used in transportation systems.
- Explain how improved transportation systems have changed society.

3.7 *Technological Devices*

4.A Explore the use of basic tools, simple materials, and techniques to safely solve problems.
- Describe the scientific principles on which various tools are based.
- Group tools and machines by their function.
- Select and safely apply appropriate tools and materials to solve simple problems.

4.B Select appropriate instruments to study materials.
- Develop simple skills to measure, record, cut, and fasten.
- Explain appropriate instrument selection for specific tasks.

4.C Identify basic computer operations and concepts.
- Identify the major parts necessary for a computer to input and output data.
- Explain and demonstrate the basic use of input and output devices (e.g., keyboard, monitor, printer, mouse).
- Explain and demonstrate the use of external and internal storage devices (e.g., disk drive, CD drive).

4.D Use basic computer software.
- Apply operating system skills to perform basic computer tasks.
- Apply basic word processing skills.
- Identify and use simple graphic and presentation graphic materials generated by the computer.
- Apply specific instructional software.

4.E Identify basic computer communication systems.
- Apply a web browser.
- Apply basic electronic mail functions.
- Use on-line searches to answer age-appropriate questions.

3.8 *Science, Technology, and Human Endeavors*

4.A Know that people select, create, and use science and technology and that they are limited by social and physical restraints.
- Identify and describe positive and negative impacts that influence or result from new tools and techniques.
- Identify how physical technology (e.g., construction, manufacturing, transportation), informational technology, and biotechnology are used to meet human needs.
- Describe how scientific discoveries and technological advancements are related.
- Identify interrelationships among technology, people, and their world.
- Apply the appropriate design process to solve a simple problem.

4.B Know how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.
- Identify and distinguish between human needs and improving the quality of life.
- Identify and distinguish between natural and human-made resources.
- Describe a technological invention and the resources that are used to develop it.

4.C Know the pros and cons of possible solutions to scientific and technological problems in society.
- Compare the positive and negative expected and unexpected impacts of technological change.
- Identify and discuss examples of technological change in the community that have both positive and negative impacts.

Academic Standards for Environment and Ecology

4.1 *Watersheds and Wetlands*

4.A Identify various types of water environments.
- Identify the lotic system (e.g., creeks, rivers, streams).
- Identify the lentic system (e.g., ponds, lakes, swamps).

4.B Explain the difference between moving and still water.
- Explain why water moves or does not move.
- Identify types of precipitation.

4.C Identify living things found in water environments.
- Identify fish, insects, and amphibians that are found in fresh water.
- Identify plants found in fresh water.

4.D Identify a wetland and the plants and animals found there.
- Identify different kinds of wetlands.
- Identify plants and animals found in wetlands.
- Explain wetlands as habitats for plants and animals.

4.E Recognize the impact of watersheds and wetlands on animals and plants.
- Explain the role of watersheds in everyday life.
- Identify the role of watersheds and wetlands for plants and animals.

4.2 *Renewable and Nonrenewable Resources*

4.A Identify needs of people.
- Identify plants, animals, water, air, minerals, and fossil fuels as natural resources.
- Explain air, water, and nutrient cycles.
- Identify how the environment provides for the needs of people.

4.B Identify products derived from natural resources.
- Identify products made from trees.
- Identify by-products of plants and animals.
- Identify the source of man-made products (e.g., plastics, metal, aluminum, fabrics, paper, cardboard).

4.C Know that some natural resources have limited life spans.
- Identify renewable and nonrenewable resources used in the local community.
- Identify various means of conserving natural resources.
- Know that natural resources have varying life spans.

4.D Identify by-products and their uses of natural resources.
- Understand the waste stream.
- Identify those items that can be recycled and those that cannot.
- Identify use of reusable products.
- Identify the use of compost, landfills, and incinerators.

4.3 *Environmental Health*

4.A Know that plants, animals, and humans are dependent on air and water.
- Know that all living things need air and water to survive.
- Describe potentially dangerous pest controls used in the home.
- Identify things that cause sickness when put into the air, water, or soil.
- Identify different areas where health can be affected by air, water, or land pollution.
- Identify actions that can prevent or reduce waste pollution.

4.B Identify how human actions affect the environmental health.
- Identify pollutants.
- Identify sources of pollution.

- Identify litter and its effect on the environment.
- Describe how people can reduce pollution.

4.C Understand that the elements of natural systems are interdependent.
- Identify some of the organisms that live together in an ecosystem.
- Understand that the components of a system all play a part in a healthy natural system.
- Identify the effects of a healthy environment on the ecosystem.

4.4 *Agriculture and Society*

4.A Know the importance of agriculture to humans.
- Identify people's basic needs.
- Explain the influence of agriculture on food, clothing, shelter, and culture from one area to another.
- Know how people depend on agriculture.

4.B Identify the role of the sciences in Pennsylvania agriculture.
- Identify common animals found on Pennsylvania farms.
- Identify common plants found on Pennsylvania farms.
- Identify the parts of important agricultural related plants (i.e., corn, soybeans, barley).
- Identify a fiber product from Pennsylvania farms.

4.C Know that food and fiber originate from plants and animals.
- Define and identify food and fiber.
- Identify what plants and animals need to grow.
- Identify agricultural products that are local and regional.
- Identify an agricultural product based on its origin.
- Describe several products and tell their origins.
- Describe the journey of a local agricultural product from production to the consumer.

4.D Identify technology and energy use associated with agriculture.
- Identify the various tools and machinery necessary for farming.
- Identify the types of energy used in producing food and fiber.
- Identify tools and machinery used in the production of agricultural products.

4.5 *Integrated Pest Management*

4.A Know types of pests.
- Identify classification of pests.
- Identify and categorize pests.
- Know how pests fit into a food chain.

4.B Explain pest control.
- Know reasons why people control pests.
- Identify different methods for controlling specific pests in the home, school, and community.
- Identify chemical labels (e.g., caution, poison, warning).

4.C Understand society's need for integrated pest management.
- Identify integrated pest management practices in the home.
- Identify integrated pest management practices outside the home.

4.6 *Ecosystems and their Interactions*

4.A Understand that living things are dependent on nonliving things in the environment for survival.
- Identify and categorize living and nonliving things.
- Describe the basic needs of an organism.
- Identify basic needs of a plant and an animal and explain how their needs are met.
- Identify plants and animals with their habitat and food sources.
- Identify environmental variables that affect plant growth.
- Describe how animals interact with plants to meet their needs for shelter.
- Describe how certain insects interact with soil for their needs.

- Understand the components of a food chain.
- Identify a local ecosystem and its living and nonliving components.
- Identify a simple ecosystem and its living and nonliving components.
- Identify common soil textures.
- Identify animals that live underground.

4.B Understand the concept of cycles.
- Explain the water cycle.
- Explain the carbon dioxide/oxygen cycle (photosynthesis).

4.C Identify how ecosystems change over time.

4.7 *Threatened, Endangered, and Extinct Species*

4.A Identify differences in living things.
- Explain why plants and animals are different colors, shapes, and sizes, and how these differences relate to their survival.
- Identify characteristics that living things inherit from their parents.
- Explain why each of the four elements in a habitat is essential for survival.
- Identify local plants or animals and describe their habitat.

4.B Know that adaptations are important for survival.
- Explain how specific adaptations can help a living organism to survive.
- Explain what happens to a living thing when its food, water, shelter, or space is changed.

4.C Define and understand extinction.
- Identify plants and animals that are extinct.
- Explain why some plants and animals are extinct.
- Know that there are local and state laws regarding plants and animals.

4.8 *Humans and the Environment*

4.A Identify the biological requirements of humans.
- Explain how a dynamically changing environment provides for sustainability of living systems.
- Identify several ways that people use natural resources.

4.B Know that environmental conditions influence where and how people live.
- Identify how regional natural resources influence what people use.
- Explain the influence of climate on how and where people live.

4.C Explain how human activities may change the environment.
- Identify everyday human activities and how they affect the environment.
- Identify examples of how human activities within a community affect the natural environment.

4.D Know the importance of natural resources in daily life.
- Identify items used in daily life that come from natural resources.
- Identify ways to conserve our natural resources.
- Identify major land uses in the community.

4.9 *Environmental Laws and Regulations*

4.A Know that there are laws and regulations for the environment.
- Identify local and state laws and regulations regarding the environment.
- Explain how the recycling law impacts the school and home.
- Identify and describe the role of a local or state agency that deals with environmental laws and regulations.

Connecting Assessment to Instruction, Answer Guide

PSSA Science Performance Indicator Grade 4, Form A

This answer guide will help you connect each ***PSSA Science Performance Indicator*** test question directly to the appropriate assessment anchor and eligible content lesson in the ***PSSA Finish Line Science, Grade 4*** workbook. The correlation to the anchor and eligible content will assist you in providing more focused instruction in the areas in which students may require additional support.

Question	Answer	Standard	Assessment Anchor and Eligible Content	*PSSA Finish Line Science, Grade 4*
1	B	3.2.4.A	S4.A.1.1.1	Unit 1, Lesson 1
2	B	3.3.4.A	S4.B.1.1.1	Unit 2, Lesson 1
3	C	3.4.4.A	S4.C.1.1.1	Unit 3, Lesson 1
4	A	3.5.4.A	S4.D.1.1.3	Unit 4, Lesson 1
5	D	3.1.4.C	S4.A.3.3.1	Unit 1, Lesson 7
6	D	3.2.4.C	S4.A.2.1.1	Unit 1, Lesson 4
7	C	3.2.4.C	S4.A.2.1.4	Unit 1, Lesson 4
8	A	3.1.4.A	S4.A.3.1.1	Unit 1, Lesson 5
9	B	3.3.4.A	S4.B.1.1.2	Unit 2, Lesson 1
10	D	3.4.4.B	S4.C.2.1.1	Unit 3, Lesson 2
11	C	3.5.4.A	S4.D.1.1.1	Unit 4, Lesson 1
12	C	3.1.4.E	S4.A.1.3.2	Unit 1, Lesson 2
13	B	3.2.4.C	S4.A.2.1.2	Unit 1, Lesson 4
14	A	4.8.4.A	S4.D.1.2.3	Unit 4, Lesson 2
15	D	4.8.4.C	S4.A.1.3.5	Unit 1, Lesson 2
16	B	3.7.4.A	S4.A.2.2.1	Unit 1, Lesson 3
17	Open-ended	4.4.4.C	S4.A.3.1.4	Unit 1, Lesson 5
18	D	3.1.4.E	S4.A.1.3.3	Unit 1, Lesson 2
19	A	3.4.4.C	S4.C.2.1.4	Unit 3, Lesson 2
20	C	4.7.4.B	S4.A.1.3.4	Unit 1, Lesson 2
21	A	4.6.4.A	S4.A.3.1.2	Unit 1, Lesson 5
22	C	3.5.4.D	S4.D.1.3.1	Unit 4, Lesson 3
23	B	3.1.4.B	S4.A.3.2.2	Unit 1, Lesson 6
24	D	4.7.4.B	S4.B.2.1.2	Unit 2, Lesson 3
25	C	3.4.4.C	S4.C.3.1.2	Unit 3, Lesson 4
26	B	4.6.4.A	S4.A.3.1.3	Unit 1, Lesson 5
27	A	4.1.4.A	S4.D.1.3.3	Unit 4, Lesson 3
28	C	3.1.4.B	S4.A.3.2.1	Unit 1, Lesson 6
29	A	3.3.4.B	S4.B.1.1.4	Unit 2, Lesson 2
30	D	3.1.4.C	S4.A.3.3.2	Unit 1, Lesson 7
31	Open-ended	4.4.4.C	S4.C.2.1.3	Unit 3, Lesson 3
32	D	4.6.4.A	S4.A.3.1.3	Unit 1, Lesson 5
33	B	3.3.4.A	S4.B.1.1.3	Unit 2, Lesson 1

34	C	3.4.4.A	S4.C.1.1.2	Unit 3, Lesson 1
35	D	3.1.4.E	S4.A.1.3.1	Unit 1, Lesson 2
36	A	3.7.4.A	S4.A.2.2.1	Unit 1, Lesson 3
37	B	3.3.4.A	S4.B.2.1.1	Unit 2, Lesson 3
38	D	3.8.4.C	S4.A.1.1.2	Unit 1, Lesson 1
39	C	3.4.4.D	S4.D.3.1.1	Unit 4, Lesson 6
40	A	3.2.4.C	S4.A.2.1.3	Unit 1, Lesson 4
41	Open-ended	3.3.4.A	S4.B.1.1.5	Unit 2, Lesson 1
42	B	3.4.4.B	S4.C.2.1.2	Unit 3, Lesson 2
43	C	3.5.4.D	S4.D.1.3.2	Unit 4, Lesson 3
44	B	3.3.4.C	S4.B.2.2.1	Unit 2, Lesson 4
45	C	3.4.4.B	S4.C.2.1.3	Unit 3, Lesson 3
46	D	4.6.4.A	S4.B.3.2.3	Unit 2, Lesson 6
47	B	4.3.4.B	S4.A.1.3.5	Unit 1, Lesson 2
48	C	3.1.4.B	S4.A.3.2.3	Unit 1, Lesson 6
49	A	3.5.4.C	S4.D.2.1.1	Unit 4, Lesson 5
50	C	4.4.4.C	S4.A.3.1.4	Unit 1, Lesson 5
51	Open-ended	4.1.4.E	S4.D.1.3.4	Unit 4, Lesson 4
52	D	3.4.4.C	S4.C.3.1.1	Unit 3, Lesson 4
53	B	3.1.4.B	S4.A.3.2.1	Unit 1, Lesson 6
54	A	4.7.4.B	S4.A.1.3.4	Unit 1, Lesson 2
55	B	3.1.4.C	S4.A.3.3.2	Unit 1, Lesson 7
56	C	4.5.4.A	S4.B.3.3.3	Unit 2, Lesson 7
57	C	3.4.4.C	S4.C.3.1.3	Unit 3, Lesson 4
58	B	3.2.4.C	S4.A.2.1.4	Unit 1, Lesson 4
59	D	3.7.4.B	S4.D.2.1.3	Unit 4, Lesson 5
60	A	4.6.4.A	S4.A.3.1.2	Unit 1, Lesson 5
61	Open-ended	3.2.4.C	S4.A.2.1.2	Unit 1, Lesson 4

NOTES

NOTES

Science

Grade 4

Teacher's Guide and Answer Key

Continental Press
520 East Bainbridge Street ▪ Elizabethtown, PA 17022
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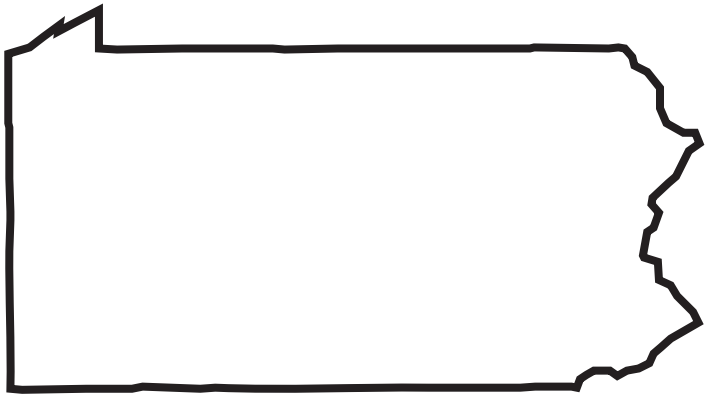
GRADE

4

PSSA Performance Indicator

Science

Form B
Teacher's Guide and Answer Key



Continental Press

Contents

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Continental Press

PSSA Science Performance Indicators

The ***PSSA Science Performance Indicator*** practice tests are designed to help students prepare for the Pennsylvania System of School Assessment (PSSA) in Science. There are two forms of the Performance Indicator available. They are parallel forms that can be administered before instruction and after, or at any time during the school year.

The ***PSSA Finish Line Science, Grade 4*** workbook provides a complete sequence of instruction in the assessed anchors and eligible content. The workbook includes guided practice and independent practice for the assessed science skills and concepts in multiple-choice and open-ended formats. A listing of Assessment Anchors and Eligible Content, as well as Academic Standards, is available at the back of this guide.

The ***PSSA Science Performance Indicators, Grade 4*** are divided into two sessions: Session 1 and Session 2. To emulate the actual testing conditions, the sessions should be administered on the same day. However, if necessary, they may be given on two consecutive days.

Session 1 contains 29 multiple-choice questions and two open-ended items. Multiple-choice questions have four answer choices, one of which is the correct answer. Students should circle the letter of the best answer. Each open-ended question is comprised of two parts, which students must answer in writing. They may be required to read a passage, analyze a table or graph, or make observations about an image.

Session 2 contains 27 multiple-choice questions and three open-ended items.

This teacher's guide includes suggestions for using these test preparation materials, directions for administering the Performance Indicator, and an answer key with correlations to the Pennsylvania Assessment Anchors and Eligible Content for Science for Grade 4 and the Academic Standards for grade 4 for Science and Technology and for Environment and Ecology. It also includes a chart connecting the questions on this performance indicator to the corresponding lesson(s) in the *PSSA Finish Line Science* workbook.

The chart below provides a sample timetable for administering the Grade 4 Performance Indicator.

Session 1	29 multiple-choice questions 2 open-ended questions	50 minutes, plus 10 minutes for preparation
Session 2	27 multiple-choice questions 3 open-ended questions	50 minutes, plus 10 minutes for preparation

Using Your Performance Indicator

Science tests today are usually given in multiple sessions. You will probably want your students to work with the ***PSSA Science Performance Indicator*** practice tests in the same way. In addition, schedule review sessions as close as possible to the completion of the test; this will enable you to go over the students' answers while the contents are still fresh in their minds. Be sure to consider with the students ways in which their written responses could be improved. Directions for using the booklet begin below. Those that you will read aloud to the class are in **boldface type** and preceded by the word **SAY;** those that are not meant to be read aloud are in regular type.

The directions that follow instruct the students to write their answers in the test booklets. If you prefer to use separate answer sheets, reproduce the answer sheets on pages 8 and 9 of this guide. Remind students to write their names on their answer sheets. Then instruct them on how to fill in the circles clearly.

Session 1

Allow 50 minutes for this first session. Make sure each student has a Performance Indicator, Form B, two No. 2 pencils, and optional answer forms, if you are using them.

SAY Turn to the inside front cover of the booklet and write your name on the line provided. You will have 50 minutes to complete Session 1.

Check to be sure students have written their names on the inside front cover of their booklets. Explain to the students that they should read each multiple-choice question and all four answer choices carefully, before marking the best answer. Remind them to write their answers to the open-ended questions neatly. Then take the time to answer any questions the students may have.

SAY Look at page 3 of your booklets.

Read, or have a volunteer read, the directions.

SAY Read the directions and questions on each page carefully. Remember that you have 50 minutes to work on Session 1. Continue working until you reach the word *Stop* on page 19. If you finish early, review your work and just sit quietly until the time is up. Are there any questions?

Pause to answer any questions.

SAY I am now writing the time on the chalkboard. Turn to page 4 and begin.

Check to be sure students have begun working on the booklet correctly. After 40 minutes, alert the students to the time left.

SAY There are 10 minutes left for you to complete Session 1. If you finish page 19 before the time is up, be sure to go back and check your answers.

When time is up, alert the class.

SAY Time's up. Please close your booklets.

Thank the class for their cooperation. Take a short break before beginning Session 2.

Session 2

Allow 50 minutes for the second session. Check that each student has two No. 2 pencils, his or her booklet, and optional answer forms, if you are using them.

SAY **Now you will begin Session 2. You will have 50 minutes to complete this session. Please turn to page 21 and follow along while I read what is on this page.**

Read, or have a volunteer read, the directions.

SAY **Read the directions and questions on each page carefully. Remember that you have 50 minutes to work on Session 2. Continue working until you reach the word *Stop* on page 39. If you finish early, review your work and just sit quietly until the time is up. Are there any questions?**

Pause to answer any questions. Remind the students that you are going to make the session seem as much as possible like the real test they will be taking.

SAY **I am now writing the time on the chalkboard. Turn to page 22 and begin.**

After 40 minutes, alert the students to the time left.

SAY **There are 10 minutes left for you to complete Session 2. If you finish page 39 before the time is up, be sure to go back and check your answers.**

When time is up, alert the class.

SAY **Time's up. Please close your booklets.**

Collect the booklets. Thank the class for their cooperation.

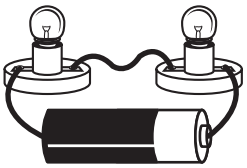
After you check the answers for Sessions 1 and 2 using the answer key on pages 6–7 of this guide, review the responses with students. Continue to work with students to improve all aspects of their science skills.

Answer Key

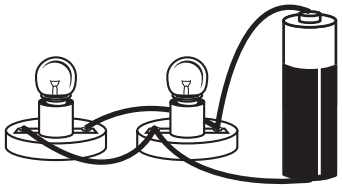
The first set of brackets following each answer contains the assessment anchor and eligible content addressed. The second set contains the academic standard.

Session 1

1. D [S4.A.1.1.1] [3.2.4.A]
2. A [S4.B.1.1.1] [3.3.4.A]
3. D [S4.C.1.1.1] [3.4.4.A]
4. C [S4.D.1.1.3] [3.5.4.A]
5. B [S4.A.3.3.1] [3.1.4.C]
6. B [S4.A.2.1.1] [3.2.4.C]
7. C [S4.A.2.1.4] [3.2.4.C]
8. C [S4.A.3.1.1] [3.1.4.A]
9. A [S4.B.1.1.2] [3.3.4.A]
10. D [S4.C.2.1.1] [3.4.4.B]
11. B [S4.D.1.1.1] [3.5.4.A]
12. A [S4.A.1.3.2] [3.1.4.E]
13. B [S4.A.2.1.2] [3.2.4.C]
14. D [S4.D.1.2.3] [4.8.4.A]
15. C [S4.A.1.3.5] [4.8.4.C]
16. A [S4.A.2.2.1] [3.7.4.A]
17. Open-ended [S4.A.3.1.4] [4.4.4.C]
    A. *Answers may vary but should list a product made from potatoes, for example:* potato chips
    B. *Answers may vary but should say something like the following:* farm, factory, grocery store
18. C [S4.A.1.3.3] [3.1.4.E]
19. D [S4.C.2.1.4] [3.4.4.C]
20. B [S4.A.1.3.4] [4.7.4.B]
21. A [S4.A.3.1.2] [4.6.4.A]
22. C [S4.D.1.3.1] [3.5.4.D]
23. B [S4.A.3.2.2] [3.1.4.B]
24. D [S4.B.2.1.2] [4.7.4.B]
25. C [S4.C.3.1.2] [3.4.4.C]
26. B [S4.A.3.1.3] [4.6.4.A]
27. A [S4.D.1.3.3] [4.1.4.A]
28. D [S4.A.3.2.1] [3.1.4.B]
29. A [S4.B.1.1.4] [3.3.4.B]
30. C [S4.A.3.3.2] [3.1.4.C]
31. Open-ended [S4.C.2.1.3] [4.4.4.C]
    A. *Drawings may vary but should show a closed series circuit, for example:*



    B. *Drawings may vary but should show a closed parallel circuit, for example:*



Session 2

32. B [S4.A.3.1.3] [4.6.4.A]
33. D [S4.B.1.1.3] [3.3.4.A]
34. D [S4.C.1.1.2] [3.4.4.A]
35. A [S4.A.1.3.1] [3.1.4.E]
36. C [S4.A.2.2.1] [3.7.4.A]
37. A [S4.B.2.1.1] [3.3.4.A]
38. B [S4.A.1.1.2] [3.8.4.C]
39. D [S4.D.3.1.1] [3.4.4.D]
40. A [S4.A.2.1.3] [3.2.4.C]
41. Open-ended [S4.B.1.1.5] [3.3.4.A]
    A. X, W, Z, Y, V
    B. *Explanations may vary but should say something like the following:* The life cycle repeats when the tomato plant reproduces.
42. B [S4.C.2.1.2] [3.4.4.B]
43. D [S4.D.1.3.2] [3.5.4.D]
44. C [S4.B.2.2.1] [3.3.4.C]
45. A [S4.C.2.1.3] [3.4.4.B]
46. D [S4.B.3.2.3] [4.6.4.A]
47. D [S4.A.1.3.5] [4.3.4.B]
48. D [S4.A.3.2.3] [3.1.4.B]
49. B [S4.D.2.1.1] [3.5.4.C]
50. B [S4.A.3.1.4] [4.4.4.C]
51. Open-ended [S4.D.1.3.4] [4.1.4.E]
    A. *Explanations may vary but should say something like the following:* Some rainfall soaks into the ground and collects in rocks and soil. This water becomes groundwater.
    B. *Explanations may vary but should say something like the following:* An increase in the number of people living in Philadelphia would most likely decrease the groundwater supply. More people would be pumping ground water to use for things like drinking, cooking, and bathing.

52. C [S4.C.3.1.1] [3.4.4.C]
53. B [S4.A.3.2.1] [3.1.4.B]
54. B [S4.A.1.3.4] [4.7.4.B]
55. C [S4.A.3.3.2] [3.1.4.C]
56. A [S4.B.3.3.3] [4.5.4.A]
57. D [S4.C.3.1.3] [3.4.4.C]
58. C [S4.A.2.1.4] [3.2.4.C]
59. D [S4.D.2.1.3] [3.7.4.B]
60. A [S4.A.3.1.2] [4.6.4.A]
61. Open-ended [S4.A.2.1.2] [3.2.4.C]
    A. *Answers may vary but should give a scientific question that can be answered by the experiment given, for example:* Which liquid dissolves chalk fastest: water, vinegar, or lemon juice?
    B. *Descriptions may vary but should describe an appropriate experiment for the question in part A, for example:* Place four identical pieces of chalk in separate containers. Add water to one container, vinegar to another container, and lemon juice to the last container. Make sure the amount of liquid is the same for each container. Place them in one location and observe them until at least one piece of chalk has dissolved.

Name _____

Session 1—Answer Sheet

1	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15	Ⓐ	Ⓑ	Ⓒ	Ⓓ
16	Ⓐ	Ⓑ	Ⓒ	Ⓓ
17	Ⓐ	Ⓑ	Ⓒ	Ⓓ
18	Ⓐ	Ⓑ	Ⓒ	Ⓓ
19	Ⓐ	Ⓑ	Ⓒ	Ⓓ
20	Ⓐ	Ⓑ	Ⓒ	Ⓓ
21	Ⓐ	Ⓑ	Ⓒ	Ⓓ
22	Ⓐ	Ⓑ	Ⓒ	Ⓓ
23	Ⓐ	Ⓑ	Ⓒ	Ⓓ
24	Ⓐ	Ⓑ	Ⓒ	Ⓓ
25	Ⓐ	Ⓑ	Ⓒ	Ⓓ
26	Ⓐ	Ⓑ	Ⓒ	Ⓓ
27	Ⓐ	Ⓑ	Ⓒ	Ⓓ
28	Ⓐ	Ⓑ	Ⓒ	Ⓓ
29	Ⓐ	Ⓑ	Ⓒ	Ⓓ
30	Ⓐ	Ⓑ	Ⓒ	Ⓓ
31	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Session 2—Answer Sheet

32	Ⓐ	Ⓑ	Ⓒ	Ⓓ
33	Ⓐ	Ⓑ	Ⓒ	Ⓓ
34	Ⓐ	Ⓑ	Ⓒ	Ⓓ
35	Ⓐ	Ⓑ	Ⓒ	Ⓓ
36	Ⓐ	Ⓑ	Ⓒ	Ⓓ
37	Ⓐ	Ⓑ	Ⓒ	Ⓓ
38	Ⓐ	Ⓑ	Ⓒ	Ⓓ
39	Ⓐ	Ⓑ	Ⓒ	Ⓓ
40	Ⓐ	Ⓑ	Ⓒ	Ⓓ
41	Ⓐ	Ⓑ	Ⓒ	Ⓓ
42	Ⓐ	Ⓑ	Ⓒ	Ⓓ
43	Ⓐ	Ⓑ	Ⓒ	Ⓓ
44	Ⓐ	Ⓑ	Ⓒ	Ⓓ
45	Ⓐ	Ⓑ	Ⓒ	Ⓓ
46	Ⓐ	Ⓑ	Ⓒ	Ⓓ
47	Ⓐ	Ⓑ	Ⓒ	Ⓓ
48	Ⓐ	Ⓑ	Ⓒ	Ⓓ
49	Ⓐ	Ⓑ	Ⓒ	Ⓓ
50	Ⓐ	Ⓑ	Ⓒ	Ⓓ
51	Ⓐ	Ⓑ	Ⓒ	Ⓓ
52	Ⓐ	Ⓑ	Ⓒ	Ⓓ
53	Ⓐ	Ⓑ	Ⓒ	Ⓓ
54	Ⓐ	Ⓑ	Ⓒ	Ⓓ
55	Ⓐ	Ⓑ	Ⓒ	Ⓓ
56	Ⓐ	Ⓑ	Ⓒ	Ⓓ
57	Ⓐ	Ⓑ	Ⓒ	Ⓓ
58	Ⓐ	Ⓑ	Ⓒ	Ⓓ
59	Ⓐ	Ⓑ	Ⓒ	Ⓓ
60	Ⓐ	Ⓑ	Ⓒ	Ⓓ
61	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Open-Ended Answer Sheet

Name _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Session 1—Answer Sheet, Answer Key

1	Ⓐ	Ⓑ	Ⓒ	●
2	●	Ⓑ	Ⓒ	Ⓓ
3	Ⓐ	Ⓑ	Ⓒ	●
4	Ⓐ	Ⓑ	●	Ⓓ
5	Ⓐ	●	Ⓒ	Ⓓ
6	Ⓐ	●	Ⓒ	Ⓓ
7	Ⓐ	Ⓑ	●	Ⓓ
8	Ⓐ	Ⓑ	●	Ⓓ
9	●	Ⓑ	Ⓒ	Ⓓ
10	Ⓐ	Ⓑ	Ⓒ	●
11	Ⓐ	●	Ⓒ	Ⓓ
12	●	Ⓑ	Ⓒ	Ⓓ
13	Ⓐ	●	Ⓒ	Ⓓ
14	Ⓐ	Ⓑ	Ⓒ	●
15	Ⓐ	Ⓑ	●	Ⓓ
16	●	Ⓑ	Ⓒ	Ⓓ

~~**17**~~	~~Ⓐ~~	~~Ⓑ~~	~~Ⓒ~~	~~Ⓓ~~
18	Ⓐ	Ⓑ	●	Ⓓ
19	Ⓐ	Ⓑ	Ⓒ	●
20	Ⓐ	●	Ⓒ	Ⓓ
21	●	Ⓑ	Ⓒ	Ⓓ
22	Ⓐ	Ⓑ	●	Ⓓ
23	Ⓐ	●	Ⓒ	Ⓓ
24	Ⓐ	Ⓑ	Ⓒ	●
25	Ⓐ	Ⓑ	●	Ⓓ
26	Ⓐ	●	Ⓒ	Ⓓ
27	●	Ⓑ	Ⓒ	Ⓓ
28	Ⓐ	Ⓑ	Ⓒ	●
29	●	Ⓑ	Ⓒ	Ⓓ
30	Ⓐ	Ⓑ	●	Ⓓ
~~**31**~~	~~Ⓐ~~	~~Ⓑ~~	~~Ⓒ~~	~~Ⓓ~~

Session 2—Answer Sheet, Answer Key

32	Ⓐ	●	Ⓒ	Ⓓ
33	Ⓐ	Ⓑ	Ⓒ	●
34	Ⓐ	Ⓑ	Ⓒ	●
35	●	Ⓑ	Ⓒ	Ⓓ
36	Ⓐ	Ⓑ	●	Ⓓ
37	●	Ⓑ	Ⓒ	Ⓓ
38	Ⓐ	●	Ⓒ	Ⓓ
39	Ⓐ	Ⓑ	Ⓒ	●
40	●	Ⓑ	Ⓒ	Ⓓ
~~**41**~~	~~Ⓐ~~	~~Ⓑ~~	~~Ⓒ~~	~~Ⓓ~~
42	Ⓐ	●	Ⓒ	Ⓓ
43	Ⓐ	Ⓑ	Ⓒ	●
44	Ⓐ	Ⓑ	●	Ⓓ
45	●	Ⓑ	Ⓒ	Ⓓ
46	Ⓐ	Ⓑ	Ⓒ	●

47	Ⓐ	Ⓑ	Ⓒ	●
48	Ⓐ	Ⓑ	Ⓒ	●
49	Ⓐ	●	Ⓒ	Ⓓ
50	Ⓐ	●	Ⓒ	Ⓓ
~~**51**~~	~~Ⓐ~~	~~Ⓑ~~	~~Ⓒ~~	~~Ⓓ~~
52	Ⓐ	Ⓑ	●	Ⓓ
53	Ⓐ	●	Ⓒ	Ⓓ
54	Ⓐ	●	Ⓒ	Ⓓ
55	Ⓐ	Ⓑ	●	Ⓓ
56	●	Ⓑ	Ⓒ	Ⓓ
57	Ⓐ	Ⓑ	Ⓒ	●
58	Ⓐ	Ⓑ	●	Ⓓ
59	Ⓐ	Ⓑ	Ⓒ	●
60	●	Ⓑ	Ⓒ	Ⓓ
~~**61**~~	~~Ⓐ~~	~~Ⓑ~~	~~Ⓒ~~	~~Ⓓ~~

PSSA Science Rubric for Open-Ended Items

Rubrics for the PSSA Science items are specific to the individual problems. The following rubric provides general guidelines for evaluating the open-ended items in ***PSSA Finish Line Science.*** In reviewing student work, tailor the rubric to the assessment anchor and eligible content covered in the item.

Score	Description
2	The student response demonstrates a thorough understanding of the content, concepts, and procedures involved in the specific anchor. The response is clear, complete, and correct. The response may contain a minor error or omission that does not detract from the student's demonstration of a thorough understanding.
1	The student response demonstrates a partial understanding of the content, concepts, and procedures involved in the specific anchor. The response is somewhat correct and may contain some work that is incomplete or unclear.
0	The student response contains insufficient evidence to demonstrate any understanding of the content, concepts, and procedures involved in the specific anchor. The response may show only information copied or paraphrased from the problem.

Pennsylvania Assessment Anchors and Eligible Content

S4.A *The Nature of Science*

Assessment Anchor S4.A.1: Reasoning and Analysis

S4.A.1.1 Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems.

- **S4.A.1.1.1** Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results (e.g., a scientific fact can be supported by making observations).
- **S4.A.1.1.2** Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment.

S4.A.1.3 Recognize and describe change in natural or human-made systems and the possible effect of those changes.

- **S4.A.1.3.1** Observe and record change by using time and measurement.
- **S4.A.1.3.2** Describe relative size, distance, or motion.
- **S4.A.1.3.3** Observe and describe the change to objects caused by temperature change or light.
- **S4.A.1.3.4** Explain what happens to a living organism when its food supply, access to water, shelter, or space is changed (e.g., it might die, migrate, change behavior, eat something else).
- **S4.A.1.3.5** Provide examples, predict, or describe how everyday human activities (e.g., solid waste production, food production and consumption, transportation, water consumption, energy production and use) may change the environment.

Assessment Anchor S4.A.2: Processes, Procedures, and Tools of Scientific Investigations

S4.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.

- **S4.A.2.1.1** Generate questions about objects, organisms, or events that can be answered through scientific investigations.
- **S4.A.2.1.2** Design and describe an investigation (a fair test) to test one variable.
- **S4.A.2.1.3** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadow, animal migrations, growth of plants), record observations, and then make a prediction based on those observations.
- **S4.A.2.1.4** State a conclusion that is consistent with the information/data.

S4.A.2.2 Identify appropriate instruments for a specific task and describe the information the instrument can provide.

- **S4.A.2.2.1** Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length-ruler, mass-balance scale, volume-beaker, temperature-thermometer; making observations: hand lens, binoculars, telescope).

Assessment Anchor S4.A.3: Systems, Models, and Patterns

S4.A.3.1 Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle).

- **S4.A.3.1.1** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).
- **S4.A.3.1.2** Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium).
- **S4.A.3.1.3** Categorize the parts of an ecosystem as either living or nonliving and describe their roles in the system.

S4.A.3.1.4 Identify the parts of the food and fiber systems as they relate to agricultural products from the source to the consumer.

S4.A.3.2 Use models to illustrate simple concepts and compare the models to what they represent.

S4.A.3.2.1 Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).

S4.A.3.2.2 Use models to make observations to explain how systems work (e.g., water cycle, Sun-Earth-Moon system).

S4.A.3.2.3 Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).

S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.

S4.A.3.3.1 Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).

S4.A.3.3.2 Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases).

S4.B *Biological Sciences*

Assessment Anchor S4.B.1: Structure and Function of Organisms

S4.B.1.1 Identify and describe similarities and differences between living things and their life processes.

S4.B.1.1.1 Identify life processes of living things (e.g., growth, digestion, respiration).

S4.B.1.1.2 Compare similar functions of external characteristics or organisms (e.g., anatomical characteristics: appendages, type of covering, body segments).

S4.B.1.1.3 Describe basic needs of plants and animals (e.g., air, water, food).

S4.B.1.1.4 Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).

S4.B.1.1.5 Describe the life cycles of different organisms (e.g., moth, grasshopper, frog, seed-producing plant).

Assessment Anchor S4.B.2: Continuity of Life

S4.B.2.1 Identify and explain how adaptations help organisms to survive.

S4.B.2.1.1 Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).

S4.B.2.1.2 Explain how specific adaptations can help living organisms survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water).

S4.B.2.2 Identify that characteristics are inherited and, thus, offspring closely resemble their parents.

S4.B.2.2.1 Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring.

Assessment Anchor S4.B.3: Ecological Behavior and Systems

S4.B.3.1 Identify and describe living and nonliving things in the environment and their interaction.

S4.B.3.1.1 Describe the living and nonliving components of a local ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park, playground).

S4.B.3.1.2 Describe interactions between living and nonliving components (e.g., plants-water, soil, sunlight, carbon dioxide, temperature; animals-food, water, shelter, oxygen, temperature) of a local ecosystem.

S4.B.3.2 Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.

S4.B.3.2.1 Describe what happens to a living thing when its habitat is changed.

S4.B.3.2.2 Describe and predict how changes in the environment (e.g., fire, pollution, flood, building dams) can affect systems.

S4.B.3.2.3 Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).

S4.B.3.3 Identify and describe human reliance on the environment at the individual or the community level.

S4.B.3.3.1 Identify everyday human activities (e.g., driving, washing, eating, manufacturing, farming) within a community that depend on the natural environment.

S4.B.3.3.2 Describe the human dependence on the food and fiber systems from production to consumption (e.g., food, clothing, shelter, products).

S4.B.3.3.3 Identify biological pests (e.g., fungi-molds; plants-foxtail, purple loosestrife, Eurasian water milfoil; animals-aphids, ticks, zebra mussels, starlings, mice) that compete with humans for resources.

S4.B.3.3.4 Identify major land uses in the urban, suburban, and rural communities (e.g., housing, commercial, recreation).

S4.B.3.3.5 Describe the effects of pollution (e.g., litter) in the community.

S4.C *Physical Sciences*

Assessment Anchor S4.C.1: Structure, Properties, and Interaction of Matter and Energy

S4.C.1.1 Describe observable physical properties of matter.

S4.C.1.1.1 Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter.

S4.C.1.1.2 Categorize/group objects using physical characteristics.

Assessment Anchor S4.C.2: Forms, Sources, Conversion, and Transfer of Energy

S4.C.2.1 Recognize basic energy types and sources, or describe how energy can be changed from one form to another.

S4.C.2.1.1 Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).

S4.C.2.1.2 Describe the flow of energy though an object or system (e.g., feeling radiant heat from a light bulb, eating food to get energy, using a battery to light a bulb or run a fan).

S4.C.2.1.3 Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches.

S4.C.2.1.4 Identify characteristics of sound (e.g., pitch, loudness, reflection).

Assessment Anchor S4.C.3: Principles of Motion and Force

S4.C.3.1 Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.

S4.C.3.1.1 Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).

S4.C.3.1.2 Compare the relative movement of objects or describe types of motion that are evident (e.g., bouncing ball, moving in a straight line, back and forth, merry-go-round).

S4.C.3.1.3 Describe the position of an object by locating it relative to another object or a stationary background (e.g., geographic direction, left, up).

S4.D *Earth and Space Sciences*

Assessment Anchor S4.D.1: Earth Features and Processes that Change Earth and Its Resources

S4.D.1.1 Describe basic landforms in Pennsylvania.

- **S4.D.1.1.1** Describe how prominent Earth features in Pennsylvania (e.g., mountains, valleys, caves, sinkholes, lakes, rivers) were formed.
- **S4.D.1.1.2** Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.
- **S4.D.1.1.3** Describe the composition of soil as weathered rock and decomposed organic remains.

S4.D.1.2 Identify the types and uses of Earth's resources.

- **S4.D.1.2.1** Identify products and by-products of plants and animals for human use (e.g., food, clothing, building materials, paper products).
- **S4.D.1.2.2** Identify the types and uses of Earth material for renewable, nonrenewable, and reusable products (e.g., human-made products: concrete, paper, plastics, fabrics).
- **S4.D.1.2.3** Recognize ways that humans benefit from the use of water resources (e.g., agriculture, energy, recreation).

S4.D.1.3 Describe Earth's different sources of water or describe changes in the form of water.

- **S4.D.1.3.1** Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans).
- **S4.D.1.3.2** Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).
- **S4.D.1.3.3** Describe or compare lentic systems (i.e., ponds, lakes, and bays) and lotic systems (i.e., streams, creeks, and rivers).
- **S4.D.1.3.4** Explain the role and relationship of a watershed or a wetland on water sources (e.g., water storage, groundwater recharge, water filtration, water source, water cycle).

Assessment Anchor S4.D.2: Weather, Climate, and Atmospheric Processes

S4.D.2.1 Identify basic weather conditions and how they are measured.

- **S4.D.2.1.1** Identify basic cloud types (i.e., cirrus, cumulus, stratus, and cumulonimbus) and make connections to basic elements of weather (e.g., changes in temperature, precipitation).
- **S4.D.2.1.2** Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction, wind speed, cloud types, precipitation).
- **S4.D.2.1.3** Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure.

Assessment Anchor S4.D.3: Composition and Structure of the Universe

S4.D.3.1 Describe Earth's relationship to the sun and the moon.

- **S4.D.3.1.1** Describe motions of the Sun-Earth-Moon system.
- **S4.D.3.1.2** Explain how the motion of the Sun-Earth-Moon system relates to time (e.g., days, months, years).
- **S4.D.3.1.3** Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis.

Academic Standards for Science and Technology

3.1 *Unifying Themes*

4.A Know that natural and human-made objects are made up of parts.
- Identify and describe what parts make up a system.
- Identify system parts that are natural and human-made (e.g., ballpoint pen, simple electrical circuits, plant anatomy).
- Describe the purpose of analyzing systems.
- Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems, and biochemical-related systems.

4.B Know models as useful simplifications of objects or processes.
- Identify different types of models.
- Identify and apply models as tools for prediction and insight.
- Apply appropriate simple modeling tools and techniques.
- Identify theories that serve as models (e.g., molecules).

4.C Illustrate patterns that regularly occur and reoccur in nature.
- Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, structural patterns in bird feathers).
- Use knowledge of natural patterns to predict next occurrences (e.g., seasons, leaf patterns, lunar phases).

4.D Know that scale is an important attribute of natural and human-made objects, events, and phenomena.
- Identify the use of scale as it relates to the measurement of distance, volume, and mass.
- Describe scale as a ratio (e.g., map scales).
- Explain the importance of scale in producing models and apply it to a model.

4.E Recognize change in natural and physical systems.
- Recognize change as fundamental to science and technology concepts.
- Examine and explain change by using time and measurement.
- Describe relative motion.
- Describe the change to objects caused by heat, cold, light, or chemicals.

3.2 *Inquiry and Design*

4.A Identify and use the nature of scientific and technological knowledge.
- Distinguish between scientific fact and a belief.
- Provide clear explanations that account for observations and results.
- Relate how new information can change existing perceptions.

4.B Describe objects in the world using the five senses.
- Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough).
- Use observations to develop a descriptive vocabulary.

4.C Recognize and use the elements of scientific inquiry to solve problems.
- Generate questions about objects, organisms, and/or events that can be answered through scientific investigations.
- Design an investigation.
- Conduct an experiment.
- State a conclusion that is consistent with the information.

4.D Recognize and use the technological design process to solve problems.
- Recognize and explain basic problems.
- Identify possible solutions and their course of action.
- Try a solution.

- Describe the solution, identify its impacts, and modify, if necessary.
- Show the steps taken and the results.

3.3 *Biological Sciences*

4.A Know the similarities and differences of living things.
- Identify life processes of living things (e.g., growth, digestion, or reaction to environment).
- Know that some organisms have similar external characteristics (e.g., anatomical characteristics: appendages, type of covering, body segments) and that similarities and differences are related to environmental habitat.
- Describe basic needs of plants and animals.

4.B Know that living things are made up of parts that have specific functions.
- Identify examples of unicellular and multicellular organisms.
- Determine how different parts of a living thing work together to make the organism function.

4.C Know that characteristics are inherited and, thus, offspring closely resemble their parents.
- Identify characteristics for animal and plant survival in different climates.
- Identify physical characteristics that appear in both parents and offspring and differ between families, strains, or species.

4.D Identify changes in living things over time.
- Compare extinct life forms with living organisms.

3.4 *Physical Science, Chemistry, and Physics*

4.A Recognize basic concepts about the structure and properties of matter.
- Describe properties of matter (e.g., hardness, reactions to simple chemical tests).
- Know that combining two or more substances can make new materials with different properties.
- Know different material characteristics (e.g., texture, state of matter, solubility).

4.B Know basic energy types, sources, and conversions.
- Identify energy forms and examples (e.g., sunlight, heat, stored, motion).
- Know the concept of the flow of energy by measuring flow through an object or system.
- Describe static electricity in terms of attraction, repulsion, and sparks.
- Apply knowledge of the basic electrical circuits to design and construct simple direct current circuits.
- Classify materials as conductors and nonconductors.
- Know and demonstrate the basic properties of heat by producing it in a variety of ways.
- Know the characteristics of light (e.g., reflection, refraction, absorption) and use them to produce heat, color, or a virtual image.

4.C Observe and describe different types of force and motion.
- Identify characteristics of sound (pitch, loudness, and echoes).
- Recognize forces that attract or repel other objects and demonstrate them.
- Describe various types of motion.
- Compare the relative movement of objects and describe types of motion that are evident.
- Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up).

4.D Describe the composition and structure of the universe and Earth's place in it.
- Recognize Earth's place in the solar system.
- Explain and illustrate the causes of seasonal changes.
- Identify planets in our solar system and their general characteristics.
- Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases, and eclipses.

3.5 *Earth Sciences*

4.A Know basic landforms and earth history.
- Describe earth processes (e.g., rusting, weathering, erosion) that have affected selected physical features in students' neighborhoods.
- Identify various earth structures (e.g., mountains, faults, drainage basins) through the use of models.
- Identify the composition of soil as weathered rock and decomposed organic remains.
- Describe fossils and the type of environment they lived in (e.g., tropical, aquatic, desert).

4.B Know types and uses of earth materials.
- Identify uses of various earth materials (e.g., buildings, highways, fuels, growing plants).
- Identify and sort earth materials according to a classification key (e.g., soil/rock type).

4.C Know basic weather elements.
- Identify cloud types.
- Identify weather patterns from data charts (including temperature, wind direction and speed, precipitation) and graphs of the data.
- Explain how the different seasons affect plants, animals, food availability, and daily human life.

4.D Recognize the earth's different water resources.
- Know that approximately three-fourths of the earth is covered by water.
- Identify and describe types of fresh and salt-water bodies.
- Identify examples of water in the form of solid, liquid, and gas on or near the surface of the earth.
- Explain and illustrate evaporation and condensation.
- Recognize other resources available from water (e.g., energy, transportation, minerals, food).

3.6 *Technology Education*

4.A Know that biotechnologies relate to propagating, growing, maintaining, adapting, treating, and converting.
- Identify agricultural and industrial production processes that involve plants and animals.
- Identify waste management treatment processes.
- Describe how knowledge of the human body influences or impacts ergonomic design.
- Describe how biotechnology has impacted various aspects of daily life (e.g., health care, agriculture, waste treatment).

4.B Know that information technologies involve encoding, transmitting, receiving, storing, retrieving, and decoding.
- Identify electronic communication methods that exist in the community (e.g., digital cameras, telephone, the Internet, television, fiber optics).
- Describe appropriate image generating techniques (e.g., photography, video).
- Demonstrate the ability to communicate an idea by applying basic sketching and drawing techniques.

4.C Know physical technologies of structural design, analysis and engineering, finance, production, marketing, research, and design.
- Identify and group a variety of construction tasks.
- Identify the major construction systems present in a specific local building.
- Identify specific construction systems that depend on each other in order to complete a project.
- Know skills used in construction systems that depend on each other in order to complete a project.
- Know skills used in construction.
- Identify examples of manufactured goods present in the home and school.
- Identify waste and pollution resulting from a manufacturing enterprise.
- Explain and demonstrate the concept of manufacturing (e.g., assemble a set of papers or ballpoint pens sequentially, mass produce an object).
- Identify transportation technologies of propelling, structuring, suspending, guiding, controlling, and supporting.

- Identify and experiment with simple machines used in transportation systems.
- Explain how improved transportation systems have changed society.

3.7 *Technological Devices*

4.A Explore the use of basic tools, simple materials, and techniques to safely solve problems.
- Describe the scientific principles on which various tools are based.
- Group tools and machines by their function.
- Select and safely apply appropriate tools and materials to solve simple problems.

4.B Select appropriate instruments to study materials.
- Develop simple skills to measure, record, cut, and fasten.
- Explain appropriate instrument selection for specific tasks.

4.C Identify basic computer operations and concepts.
- Identify the major parts necessary for a computer to input and output data.
- Explain and demonstrate the basic use of input and output devices (e.g., keyboard, monitor, printer, mouse).
- Explain and demonstrate the use of external and internal storage devices (e.g., disk drive, CD drive).

4.D Use basic computer software.
- Apply operating system skills to perform basic computer tasks.
- Apply basic word processing skills.
- Identify and use simple graphic and presentation graphic materials generated by the computer.
- Apply specific instructional software.

4.E Identify basic computer communication systems.
- Apply a web browser.
- Apply basic electronic mail functions.
- Use on-line searches to answer age-appropriate questions.

3.8 *Science, Technology, and Human Endeavors*

4.A Know that people select, create, and use science and technology and that they are limited by social and physical restraints.
- Identify and describe positive and negative impacts that influence or result from new tools and techniques.
- Identify how physical technology (e.g., construction, manufacturing, transportation), informational technology, and biotechnology are used to meet human needs.
- Describe how scientific discoveries and technological advancements are related.
- Identify interrelationships among technology, people, and their world.
- Apply the appropriate design process to solve a simple problem.

4.B Know how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.
- Identify and distinguish between human needs and improving the quality of life.
- Identify and distinguish between natural and human-made resources.
- Describe a technological invention and the resources that are used to develop it.

4.C Know the pros and cons of possible solutions to scientific and technological problems in society.
- Compare the positive and negative expected and unexpected impacts of technological change.
- Identify and discuss examples of technological change in the community that have both positive and negative impacts.

Academic Standards for Environment and Ecology

4.1 *Watersheds and Wetlands*

4.A Identify various types of water environments.
- Identify the lotic system (e.g., creeks, rivers, streams).
- Identify the lentic system (e.g., ponds, lakes, swamps).

4.B Explain the difference between moving and still water.
- Explain why water moves or does not move.
- Identify types of precipitation.

4.C Identify living things found in water environments.
- Identify fish, insects, and amphibians that are found in fresh water.
- Identify plants found in fresh water.

4.D Identify a wetland and the plants and animals found there.
- Identify different kinds of wetlands.
- Identify plants and animals found in wetlands.
- Explain wetlands as habitats for plants and animals.

4.E Recognize the impact of watersheds and wetlands on animals and plants.
- Explain the role of watersheds in everyday life.
- Identify the role of watersheds and wetlands for plants and animals.

4.2 *Renewable and Nonrenewable Resources*

4.A Identify needs of people.
- Identify plants, animals, water, air, minerals, and fossil fuels as natural resources.
- Explain air, water, and nutrient cycles.
- Identify how the environment provides for the needs of people.

4.B Identify products derived from natural resources.
- Identify products made from trees.
- Identify by-products of plants and animals.
- Identify the source of man-made products (e.g., plastics, metal, aluminum, fabrics, paper, cardboard).

4.C Know that some natural resources have limited life spans.
- Identify renewable and nonrenewable resources used in the local community.
- Identify various means of conserving natural resources.
- Know that natural resources have varying life spans.

4.D Identify by-products and their uses of natural resources.
- Understand the waste stream.
- Identify those items that can be recycled and those that cannot.
- Identify use of reusable products.
- Identify the use of compost, landfills, and incinerators.

4.3 *Environmental Health*

4.A Know that plants, animals, and humans are dependent on air and water.
- Know that all living things need air and water to survive.
- Describe potentially dangerous pest controls used in the home.
- Identify things that cause sickness when put into the air, water, or soil.
- Identify different areas where health can be affected by air, water, or land pollution.
- Identify actions that can prevent or reduce waste pollution.

4.B Identify how human actions affect the environmental health.
- Identify pollutants.
- Identify sources of pollution.

- Identify litter and its effect on the environment.
- Describe how people can reduce pollution.

4.C Understand that the elements of natural systems are interdependent.
- Identify some of the organisms that live together in an ecosystem.
- Understand that the components of a system all play a part in a healthy natural system.
- Identify the effects of a healthy environment on the ecosystem.

4.4 *Agriculture and Society*

4.A Know the importance of agriculture to humans.
- Identify people's basic needs.
- Explain the influence of agriculture on food, clothing, shelter, and culture from one area to another.
- Know how people depend on agriculture.

4.B Identify the role of the sciences in Pennsylvania agriculture.
- Identify common animals found on Pennsylvania farms.
- Identify common plants found on Pennsylvania farms.
- Identify the parts of important agricultural related plants (i.e., corn, soybeans, barley).
- Identify a fiber product from Pennsylvania farms.

4.C Know that food and fiber originate from plants and animals.
- Define and identify food and fiber.
- Identify what plants and animals need to grow.
- Identify agricultural products that are local and regional.
- Identify an agricultural product based on its origin.
- Describe several products and tell their origins.
- Describe the journey of a local agricultural product from production to the consumer.

4.D Identify technology and energy use associated with agriculture.
- Identify the various tools and machinery necessary for farming.
- Identify the types of energy used in producing food and fiber.
- Identify tools and machinery used in the production of agricultural products.

4.5 *Integrated Pest Management*

4.A Know types of pests.
- Identify classification of pests.
- Identify and categorize pests.
- Know how pests fit into a food chain.

4.B Explain pest control.
- Know reasons why people control pests.
- Identify different methods for controlling specific pests in the home, school, and community.
- Identify chemical labels (e.g., caution, poison, warning).

4.C Understand society's need for integrated pest management.
- Identify integrated pest management practices in the home.
- Identify integrated pest management practices outside the home.

4.6 *Ecosystems and their Interactions*

4.A Understand that living things are dependent on nonliving things in the environment for survival.
- Identify and categorize living and nonliving things.
- Describe the basic needs of an organism.
- Identify basic needs of a plant and an animal and explain how their needs are met.
- Identify plants and animals with their habitat and food sources.
- Identify environmental variables that affect plant growth.
- Describe how animals interact with plants to meet their needs for shelter.
- Describe how certain insects interact with soil for their needs.

- Understand the components of a food chain.
- Identify a local ecosystem and its living and nonliving components.
- Identify a simple ecosystem and its living and nonliving components.
- Identify common soil textures.
- Identify animals that live underground.

4.B Understand the concept of cycles.
- Explain the water cycle.
- Explain the carbon dioxide/oxygen cycle (photosynthesis).

4.C Identify how ecosystems change over time.

4.7 *Threatened, Endangered, and Extinct Species*

4.A Identify differences in living things.
- Explain why plants and animals are different colors, shapes, and sizes, and how these differences relate to their survival.
- Identify characteristics that living things inherit from their parents.
- Explain why each of the four elements in a habitat is essential for survival.
- Identify local plants or animals and describe their habitat.

4.B Know that adaptations are important for survival.
- Explain how specific adaptations can help a living organism to survive.
- Explain what happens to a living thing when its food, water, shelter, or space is changed.

4.C Define and understand extinction.
- Identify plants and animals that are extinct.
- Explain why some plants and animals are extinct.
- Know that there are local and state laws regarding plants and animals.

4.8 *Humans and the Environment*

4.A Identify the biological requirements of humans.
- Explain how a dynamically changing environment provides for sustainability of living systems.
- Identify several ways that people use natural resources.

4.B Know that environmental conditions influence where and how people live.
- Identify how regional natural resources influence what people use.
- Explain the influence of climate on how and where people live.

4.C Explain how human activities may change the environment.
- Identify everyday human activities and how they affect the environment.
- Identify examples of how human activities within a community affect the natural environment.

4.D Know the importance of natural resources in daily life.
- Identify items used in daily life that come from natural resources.
- Identify ways to conserve our natural resources.
- Identify major land uses in the community.

4.9 *Environmental Laws and Regulations*

4.A Know that there are laws and regulations for the environment.
- Identify local and state laws and regulations regarding the environment.
- Explain how the recycling law impacts the school and home.
- Identify and describe the role of a local or state agency that deals with environmental laws and regulations.

Connecting Assessment to Instruction, Answer Guide

PSSA Science Performance Indicator Grade 4, Form B

This answer guide will help you connect each ***PSSA Science Performance Indicator*** test question directly to the appropriate assessment anchor and eligible content lesson in the ***PSSA Finish Line Science, Grade 4*** workbook. The correlation to the anchor and eligible content will assist you in providing more focused instruction in the areas in which students may require additional support.

Question	Answer	Standard	Assessment Anchor and Eligible Content	*PSSA Finish Line Science, Grade 4*
1	D	3.2.4.A	S4.A.1.1.1	Unit 1, Lesson 1
2	A	3.3.4.A	S4.B.1.1.1	Unit 2, Lesson 1
3	D	3.4.4.A	S4.C.1.1.1	Unit 3, Lesson 1
4	C	3.5.4.A	S4.D.1.1.3	Unit 4, Lesson 1
5	B	3.1.4.C	S4.A.3.3.1	Unit 1, Lesson 7
6	B	3.2.4.C	S4.A.2.1.1	Unit 1, Lesson 4
7	C	3.2.4.C	S4.A.2.1.4	Unit 1, Lesson 4
8	C	3.1.4.A	S4.A.3.1.1	Unit 1, Lesson 5
9	A	3.3.4.A	S4.B.1.1.2	Unit 2, Lesson 1
10	D	3.4.4.B	S4.C.2.1.1	Unit 3, Lesson 2
11	B	3.5.4.A	S4.D.1.1.1	Unit 4, Lesson 1
12	A	3.1.4.E	S4.A.1.3.2	Unit 1, Lesson 2
13	B	3.2.4.C	S4.A.2.1.2	Unit 1, Lesson 4
14	D	4.8.4.A	S4.D.1.2.3	Unit 4, Lesson 2
15	C	4.8.4.C	S4.A.1.3.5	Unit 1, Lesson 2
16	A	3.7.4.A	S4.A.2.2.1	Unit 1, Lesson 3
17	Open-ended	4.4.4.C	S4.A.3.1.4	Unit 1, Lesson 5
18	C	3.1.4.E	S4.A.1.3.3	Unit 1, Lesson 2
19	D	3.4.4.C	S4.C.2.1.4	Unit 3, Lesson 2
20	B	4.7.4.B	S4.A.1.3.4	Unit 1, Lesson 2
21	A	4.6.4.A	S4.A.3.1.2	Unit 1, Lesson 5
22	C	3.5.4.D	S4.D.1.3.1	Unit 4, Lesson 3
23	B	3.1.4.B	S4.A.3.2.2	Unit 1, Lesson 6
24	D	4.7.4.B	S4.B.2.1.2	Unit 2, Lesson 3
25	C	3.4.4.C	S4.C.3.1.2	Unit 3, Lesson 4
26	B	4.6.4.A	S4.A.3.1.3	Unit 1, Lesson 5
27	A	4.1.4.A	S4.D.1.3.3	Unit 4, Lesson 3
28	D	3.1.4.B	S4.A.3.2.1	Unit 1, Lesson 6
29	A	3.3.4.B	S4.B.1.1.4	Unit 2, Lesson 2
30	C	3.1.4.C	S4.A.3.3.2	Unit 1, Lesson 7
31	Open-ended	4.4.4.C	S4.C.2.1.3	Unit 3, Lesson 3
32	B	4.6.4.A	S4.A.3.1.3	Unit 1, Lesson 5
33	D	3.3.4.A	S4.B.1.1.3	Unit 2, Lesson 1

34	D	3.4.4.A	S4.C.1.1.2	Unit 3, Lesson 1
35	A	3.1.4.E	S4.A.1.3.1	Unit 1, Lesson 2
36	C	3.7.4.A	S4.A.2.2.1	Unit 1, Lesson 3
37	A	3.3.4.A	S4.B.2.1.1	Unit 2, Lesson 3
38	B	3.8.4.C	S4.A.1.1.2	Unit 1, Lesson 1
39	D	3.4.4.D	S4.D.3.1.1	Unit 4, Lesson 6
40	A	3.2.4.C	S4.A.2.1.3	Unit 1, Lesson 4
41	Open-ended	3.3.4.A	S4.B.1.1.5	Unit 2, Lesson 1
42	B	3.4.4.B	S4.C.2.1.2	Unit 3, Lesson 2
43	D	3.5.4.D	S4.D.1.3.2	Unit 4, Lesson 3
44	C	3.3.4.C	S4.B.2.2.1	Unit 2, Lesson 4
45	A	3.4.4.B	S4.C.2.1.3	Unit 3, Lesson 3
46	D	4.6.4.A	S4.B.3.2.3	Unit 2, Lesson 6
47	D	4.3.4.B	S4.A.1.3.5	Unit 1, Lesson 2
48	D	3.1.4.B	S4.A.3.2.3	Unit 1, Lesson 6
49	B	3.5.4.C	S4.D.2.1.1	Unit 4, Lesson 5
50	B	4.4.4.C	S4.A.3.1.4	Unit 1, Lesson 5
51	Open-ended	4.1.4.E	S4.D.1.3.4	Unit 4, Lesson 4
52	C	3.4.4.C	S4.C.3.1.1	Unit 3, Lesson 4
53	B	3.1.4.B	S4.A.3.2.1	Unit 1, Lesson 6
54	B	4.7.4.B	S4.A.1.3.4	Unit 1, Lesson 2
55	C	3.1.4.C	S4.A.3.3.2	Unit 1, Lesson 7
56	A	4.5.4.A	S4.B.3.3.3	Unit 2, Lesson 7
57	D	3.4.4.C	S4.C.3.1.3	Unit 3, Lesson 4
58	C	3.2.4.C	S4.A.2.1.4	Unit 1, Lesson 4
59	D	3.7.4.B	S4.D.2.1.3	Unit 4, Lesson 5
60	A	4.6.4.A	S4.A.3.1.2	Unit 1, Lesson 5
61	Open-ended	3.2.4.C	S4.A.2.1.2	Unit 1, Lesson 4

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Science

Grade 4

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