

2018 SCPASS Data Review Report Science Grades 4, 6, and 8

In October, the South Carolina Department of Education convened a panel of experts to review item data on the South Carolina Palmetto Assessment of State Standards for Science for grades 4, 6, and 8. The panel looked at items with a high percentage of students answering correctly and items with a low percentage of students answering correctly. The discussions of that panel yielded the following recommendations.

Teachers on this year's panel felt that last year's suggestions were still extremely relevant and that teachers should be reminded to look at last year's Data Review Report (2017). The panel offers these suggestions as an addendum to those from last year.

For students:

- Read questions carefully to clarify what is being asked.
- Read all answer choices before making a selection.

For teachers:

- Use diverse charts, maps, diagrams and models with all content.
- Expose students to reading graphs and data tables; identify and explain overall trends.
 - Tabled data may not be in order (ex. solar distance of planets).
 - Graphed data may not have axes representing increasing numbers.
- Students should be practicing application and use of the metric system.
- Teach the logical sequence of planning and conducting experiments, developing testable hypotheses, collecting and analyzing data, and reporting results.
 - Students should be developing their own experimental designs.
 - Develop and write hypotheses using formats other than “If, . . . then”
 - Identify the variables and constants in an investigation.
 - Write/ develop procedures based on scientific writing principles.
- Students should be developing, modifying, and using two dimensional representations of three dimensional models and explain the causes and effects of the phenomena being represented.
- Continue to expose students to classroom investigations based on content knowledge.
- Provide short reading passages to accompany graphs, tables, charts, and diagrams that require analysis and interpretation to draw a conclusion, evaluate arguments, or propose a solution.
- Spiral and connect learning throughout the year by consistently reviewing previous concepts as they relate to new content.
 - Recognize connections between content in related indicators.

Content concerns:

4th Grade:

- Introduce students to more complex data sets.
 - Items 1, 2, 6, and 8 on the *SCPASS Science Grade 4 Sample Items* provide some examples that assist teachers in developing classroom items that ask students to analyze data.
<https://ed.sc.gov/tests/tests-files/scpass-files/2018-science-grade4-release-items/>
- Allow students to critically analyze questions, make statements, draw conclusions, propose solutions, and pose arguments.
 - Examples:
 - Identify the statement that best explains why shadows seem to change throughout the day. (4.E.3B.3)
 - Identify the best solution to the design of a device to transmit sound a greater distance. (4.P.4B.3)
 - Items 9 and 12 on the *SCPASS Science Grade 4 Sample Items* are examples that ask students to critically analyze information to reach the correct conclusion.
<https://ed.sc.gov/tests/tests-files/scpass-files/2018-science-grade4-release-items/>
- Students need to be exposed to the collection of daily/ weekly weather data as well as identifying and explaining trends in the data. (4.E.2B.1-.3)
- Frequently confused term: reflect/ refract, rotation/ revolution, weather/ climate

6th Grade:

- Generate diagrams/ graphic organizers, and be able to explain the phenomenon or process taking place.
 - Items 6 and 7 on the *SCPASS Science Grade 6 Sample Items* are examples that teachers can use to generate classroom assessment items that ask students to identify or explain what the diagrams are representing.
<https://ed.sc.gov/tests/tests-files/scpass-files/2018-science-grade6-release-items/>
- Identify the variables in an experiment and the correct setup of the trials.
- Trace the transformation of energy, for example: chemical to light, light to heat, electric to mechanical. (6.P.3A.1)
- Students need to be given multiple examples of phenomena occurring in the natural world (ex. transformation of kinetic energy into potential energy; convection of heat through a fluid).
 - Item 9 on the *SCPASS Science Grade 6 Sample Items* shows one way a teacher can develop classroom assessment items that ask students to identify when transformation occurs using a model.
<https://ed.sc.gov/tests/tests-files/scpass-files/2018-science-grade6-release-items/>

8th Grade:

- Students need to be exposed to the communication of planetary data in percentages relative to Earth values.
 - Example: Venus's diameter is 95% that of Earth's. (8.E.4.B.1)
- Expose students to the different ways wave interference is modeled. (8.P.3A.4)

- Item 8 on the *SCPASS Science Grade 8 Sample Items* shows one way to model interference.
<https://ed.sc.gov/tests/tests-files/scpass-files/2018-science-grade8-release-items/>
- Calculate average speed. (8.P.2A.7)
- Generate models of, and explain Newton’s third law of motion. (8.P.3A.3)
- Present multiple mechanisms and results of weathering, erosion, and deposition. (8.E.5A.1)
- Explain how volcanic activity differs at plate boundaries and hot spots. (8.P.5B.1)
 - Items 15 and 16 on the *SCPASS Science Grade 8 Sample Items* represent ways teachers can generate classroom assessment items asking students to use diagrams or maps that ask students to identify the process or phenomenon being modeled.
<https://ed.sc.gov/tests/tests-files/scpass-files/2018-science-grade8-release-items/>
- Identify local and global effects of volcanic activity related to the impact on life, air quality, and water quality. (8.E.5B.3)
 - Students might be asked to identify the hazards (such as ash fall and mud flow) that can occur after a volcanic eruption and the local and global effects that result.
- Frequently confused terms: weathering/ erosion/ deposition