SC READY Science Grade 4

2024 Data Review Report

Data Recognition Corporation and the South Carolina Department of Education Office of Assessment and Standards convened a committee of content experts to review item-level data from the Spring 2024 SC READY Grade 4 Field Test. The committee analyzed and discussed the items and the data. The committee acknowledged the demanding work of South Carolina educators and offered these relevant and useful instructional strategies.

The Data Review Committee was also mindful that the *South Carolina College- and Career-Ready Science Standards 2021* were fully implemented for the first time in the 2023–2024 school year. These strategies reflect the higher rigor of the new standards.

General Instructional Strategies

- Provide students opportunities to make claims and use evidence from data to support their claims. Practice written explanations as well as discussions—allow students to be challenged by their peers and engage in argument using evidence. Ask students to make inferences based on reading passages.
- Expose students to a variety of diagrams, charts, and models. Students should be able to:
    - Explain the relationship among the components of the model.
    - Evaluate and revise models that better support the intent of the model.
    - Generate and peer-evaluate models.
- Reinforce the scientific terminology and concepts as students can use and apply these to communicate and demonstrate their knowledge.
- Expose student to graphs and model how to:
    - Identify trends,
    - Explain relationships among variables,
    - Summarize the data,
    - Use the data as evidence to refute or support an argument/claim.

Focused Strategies

Provide opportunities for students to do the following.

4-PS3-1, PS3-3

- Investigate the connection between speed and energy by manipulating objects and variables.
    - Test and record observations of the effects of changing variables. For example,
        - drop-height and the weight on falling objects
        - ramp height and the speed of a toy car
        - speed and weight have on the two colliding objects
    - Make connections and pose questions that connect energy to moving objects (e.g., collisions, speed).
    - Practice communicating collected data (e.g., graph, data table).

4-PS3-2, 4-PS3-4

- Experiment with simple circuits and identify how the energy is transferred through the system.
- Distinguish electrical energy and stored energy as it relates to devices.
- Refine devices that convert energy from one form to another given specific criteria and constraints.

4-PS4-1

- Understand the applications of the terms amplitude and wavelength before investigating or modeling.
- Brainstorm examples of waves in our everyday lives.
- Investigate the variables that affect wave amplitude and wavelength (e.g., water, rope, spring toy).
- Build and label models of waves.

4-PS4-3

- Emphasize that animals communicate in many ways (e.g., light, sounds).
- Discuss pros and cons of different means of communication, and how solutions might change in different situations.
- Devise a form of communication (e.g., “spy codes,” decoders).

4-LS1-1

- Use observations/pictures/simulation of seeds and plant structures and explain how these structures help the organism survive.
    - Dissect different types of seeds or plant structures and use observations to explain how the structures help a plant survive and reproduce.
    - Discuss how identified structures allow seeds to be disbursed.
- Investigate both familiar and unfamiliar animals.
    - Describe how animal structures and functions (e.g., camouflage, scales) affect their safety and survival.
    - Create an imaginary animal that lives in a specific type of environment and explain how their structure would help them to survive.
- Research examples of biomimicry (how humans have used the structures found in nature) to design devices and tools to help us in everyday life (i.e., Velcro was inspired by burdock seeds.).

4-LS1-2

- Create models of various responses to stimuli and ask them to explain how changing inputs or stimuli might change behavior responses.
- Compare human senses and processes to those of other animals.
    - Provide opportunities for students to observe animals reacting to stimuli.
    - Take virtual field trips to zoos and museums.

4-ESS1-1

- Create models of rock layers (e.g., modeling clay, salt colored with chalk, filling a laundry basket).
- Show videos or time-lapsed simulation of rock layer forming over time.
- Analyze data from rock layers and fossils in different settings to compare marine and land fossils.
- Use a geologic column to provide evidence for how an area has changed over time.

4-ESS2-1

- Investigate erosion using a stream table.
    - Observe the outcomes as variables change (e.g., slope, water speed, vegetation on the surface, rocks or gravel on the surface).

4-ESS2-2

- Practice reading maps to identify landforms and topography.
    - Connect characteristic features to identify plate boundaries.
        - Use and apply the correct terminology used to describe plate boundaries and the features found at plate boundaries.
    - Make connections between features and landforms (e.g., waterfalls where there are hills or mountains, canyons where there is a river at the bottom).
    - Understand how to use symbols, the key and the compass rose found on maps.
- Use topographic maps to identify
    - areas of Earth's surface that are flatter those that are less steep,
    - lakes, mountains, and rivers,
    - wooded areas.
- Create topographic maps of a familiar area
- Use maps to infer what landforms/features might be found at a location.

4-ESS3-1

- Compare non-renewable and renewable energy sources.
    - Discuss if and how these resources are replenished.
    - Explain the positive and negative effects obtaining and using the resources have on humans and the environment.
    - Explore environmental impacts of hydroelectric dams in South Carolina.

4-ESS3-2

- Investigate natural disasters and the impact on humans.
    - Discuss solutions to mitigate the impacts.
- Develop and test structures that withstand hazards that accompany natural disasters (e.g., the three little pigs analogy could be tested using a hair dryer or a fan).
- *Note: Students who do not live in a coastal area might need to be introduced to tides and how these can cause flooding.*