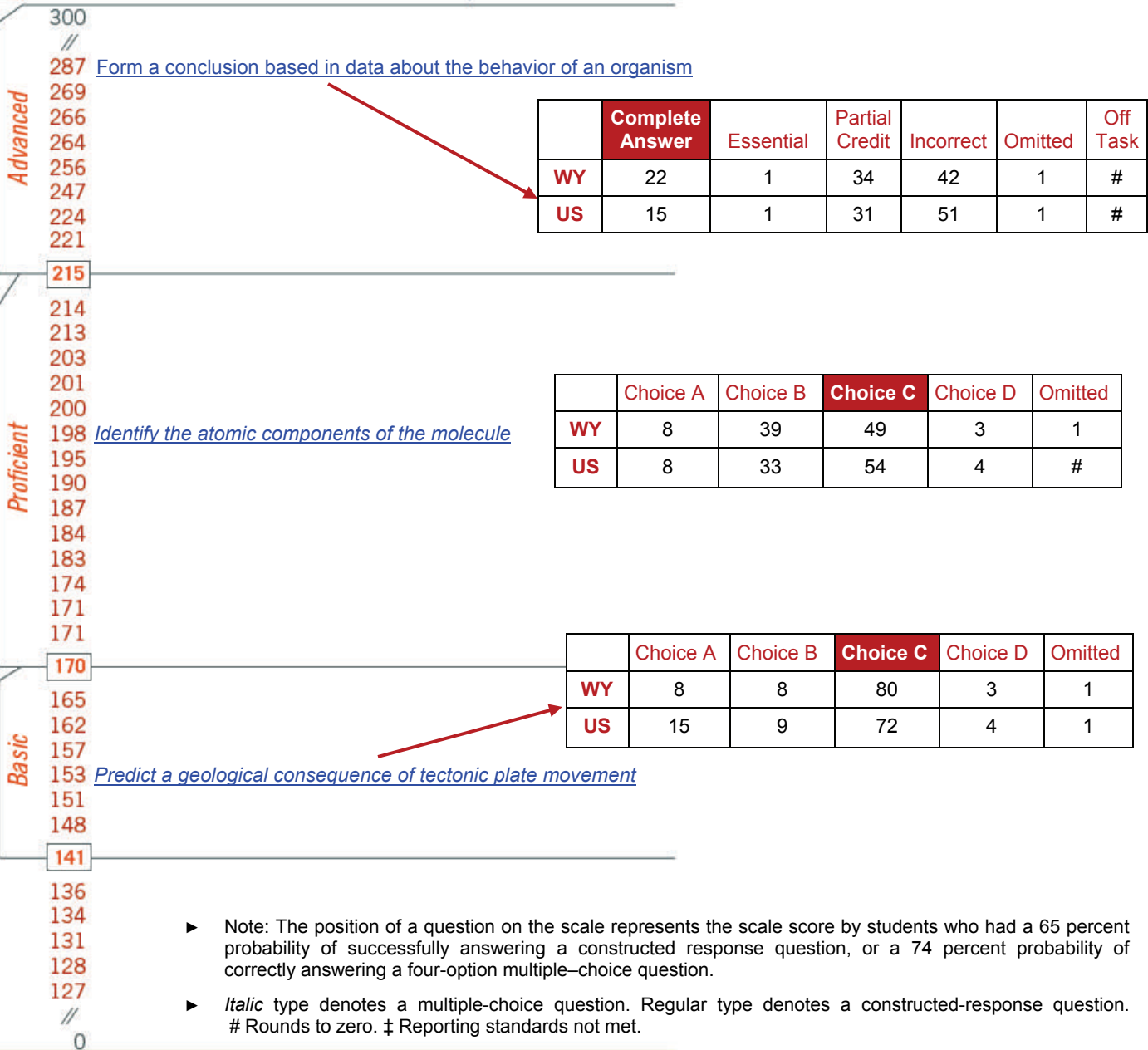


Grade 8 Report

Item Map and Performance Snapshot

The National Assessment of Educational Progress (NAEP) uses both multiple choice and constructed-response test items to assess eighth graders' skills in three science areas: Physical Science, Life Science, Earth and Space Science. Scale scores range from 0 to 300, wherein a 141 denotes NAEP's *Basic* achievement benchmark (i.e., approximately a "grade level" performance); 170 reflects *Proficient* results which means competency on challenging material, and 215 is considered to be *Advanced*.

Wyoming and the Nation — Performance on Test Items



- ▶ Note: The position of a question on the scale represents the scale score by students who had a 65 percent probability of successfully answering a constructed response question, or a 74 percent probability of correctly answering a four-option multiple-choice question.
- ▶ *Italic* type denotes a multiple-choice question. Regular type denotes a constructed-response question. # Rounds to zero. ‡ Reporting standards not met.
- ▶ SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Released Test Item Snapshot

The National Assessment of Educational Progress (NAEP) uses both multiple choice and constructed-response test items to assess eighth graders' skills in three science areas: Physical Science, Life Science, Earth and Space Science. Scale scores range from 0 to 300, wherein a 141 denotes NAEP's *Basic* achievement benchmark (i.e., approximately a "grade level" performance); 170 reflects *Proficient* results which means competency on challenging material, and 215 is considered to be *Advanced*.

Form a conclusion based on data about the behavior of an organism

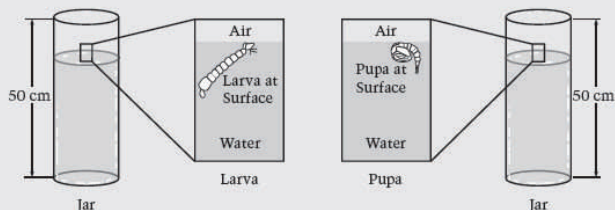
- ▶ This test item requires students to draw a conclusion and to explain their reasoning based on the data in the table.

The question that follows refers to the investigation below.

Some students were studying the life cycle of mosquitoes. They learned that mosquito larvae and pupae spend part of their time at the surface of water.

The students wanted to find out how a larva and pupa behaved when the jars they were in were disturbed. They put one larva and one pupa in identical tall jars of water at 20°C as shown below.

JARS WITH LARVA AND PUPA



The students tapped on the jars when the larva and pupa were at the surface of the water. The larva and pupa dove down into the jars, and then slowly came to the surface.

The students measured the depth each larva and pupa reached and the amount of time each stayed underwater. The students repeated this step five times and calculated the average of each of their measurements.

Their results are summarized in the table below.

DATA TABLE

Number of Trials	Larva		Pupa	
	Average Depth Reached (centimeters)	Average Length of Time Underwater (seconds)	Average Depth Reached (centimeters)	Average Length of Time Underwater (seconds)
5	22	90	38	120

- ▶ Student responses to this question were rated using four scoring levels—Complete, Essential, Partial, and Unsatisfactory/Incorrect. Scoring criteria for *Complete* and *Essential* responses are shown to the right.
- ▶ SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Which statement(s) is (are) supported by these data? You may fill in more than one oval.

- Ⓐ The larva dives deeper than the pupa.
- Ⓑ The larva stays underwater longer than the pupa.
- Ⓒ The length of the larva affects the depth of its dive.
- Ⓓ The pupa dives deeper than the larva.
- Ⓔ The pupa stays underwater longer than the larva.
- Ⓕ The shape of the pupa helps it dive deeper than the larva.

Explain why you selected the statement(s) you did, using the data in the table.

COMPLETE RESPONSE #1:

I picked that the pupa dives deeper than the larva because the pupa dives 38 (cm) and the larva dives 22 (cm). I also picked the pupa stays underwater longer than the larva because the pupa stays underwater 120 seconds and the larva stays underwater 90 seconds.

COMPLETE RESPONSE #2:

The pupa stays underwater longer than the larva does by 40 seconds. The pupa also dives deeper than the larva by 16 centimeters.

Form a conclusion based on data about the behavior of an organism

Complete answer	Selected only statements (D) and (E) and referred to the data in the table to correctly explain <i>both</i> selections. Student explanations cited numeric data from the table. No selections of statements (A), (B), (C), and (F) were included.
Essential	Selected only statements (D) and (E) and referred to the data in the table to correctly explain <i>one of the</i> selections. Student explanations cited numeric data from the table. No selections of statements (A), (B), (C), and (F) were included.

Grade 8 Report

Released Test Item Snapshot

The National Assessment of Educational Progress (NAEP) uses both multiple choice and constructed-response test items to assess eighth graders' skills in three science areas: Physical Science, Life Science, Earth and Space Science. Scale scores range from 0 to 300, wherein a 141 denotes NAEP's *Basic* achievement benchmark (i.e., approximately a "grade level" performance); 170 reflects *Proficient* results which means competency on challenging material, and 215 is considered to be *Advanced*.

Identify the atomic components of the molecule

This test item measures eighth-graders' performance in the Physical Science content area. The question asks students to identify what atoms make up a water molecule.

- ▶ Forty-nine percent (49%) of Wyoming's eighth graders answered the question correctly (Choice C).

What atoms combine to make up a molecule of water?

- (A) 1 hydrogen, 1 oxygen
- (B) 1 hydrogen, 2 oxygen
- (C) 2 hydrogen, 1 oxygen
- (D) 2 hydrogen, 2 oxygen

	Choice A	Choice B	Choice C	Choice D	Omitted
WY	8	39	49	3	1
US	8	33	54	4	#

The most common incorrect answer (Choice B), which was selected by almost forty percent (40%) of grade 8 students in Wyoming, represents a conceptual misunderstanding, i.e., students who incorrectly recalled the chemical formula of the compound by associating two atoms with oxygen, rather than hydrogen.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Released Test Item Snapshot

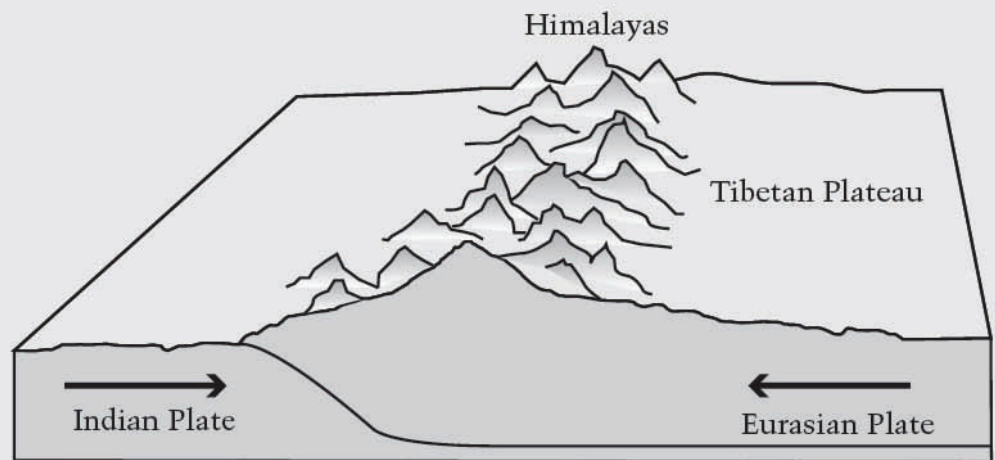
The National Assessment of Educational Progress (NAEP) uses both multiple choice and constructed-response test items to assess eighth graders' skills in three science areas: Physical Science, Life Science, Earth and Space Science. Scale scores range from 0 to 300, wherein a 141 denotes NAEP's *Basic* achievement benchmark (i.e., approximately a "grade level" performance); 170 reflects *Proficient* results which means competency on challenging material, and 215 is considered to be *Advanced*.

Predict a geological consequence of tectonic plate movements

This test item measures eighth-graders' performance in the Earth and Space Sciences content area, and asks students to predict a geological consequence from the collision of two tectonic plates.

The two most common incorrect answers (Choices A and B) were selected by almost one-in-six or 16 percent of Wyoming eighth graders, representing conceptual misunderstandings that the collision of two tectonic plates would result in periodic volcanic eruptions or a lowering of the elevation of the Tibetan Plateau.

The diagram below shows the collision of two tectonic plates in Asia.



What is a result of this collision?

- (A) Volcanoes erupt periodically.
- (B) The Tibetan Plateau slowly sinks.
- (C) The Himalayas increase in height each year.
- (D) Glaciers on the Tibetan Plateau melt.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

	Choice A	Choice B	Choice C	Choice D	Omitted
WY	8	8	80	3	1
US	15	9	72	4	1