Alaska

Comprehensive System of Student Assessment (CSSA)

Guide to Test Interpretation for the Grade 4 Science Standards Based Assessment For Parents and Students Spring 2009

Explanation of Examinations and Scoring

The Purpose of Testing

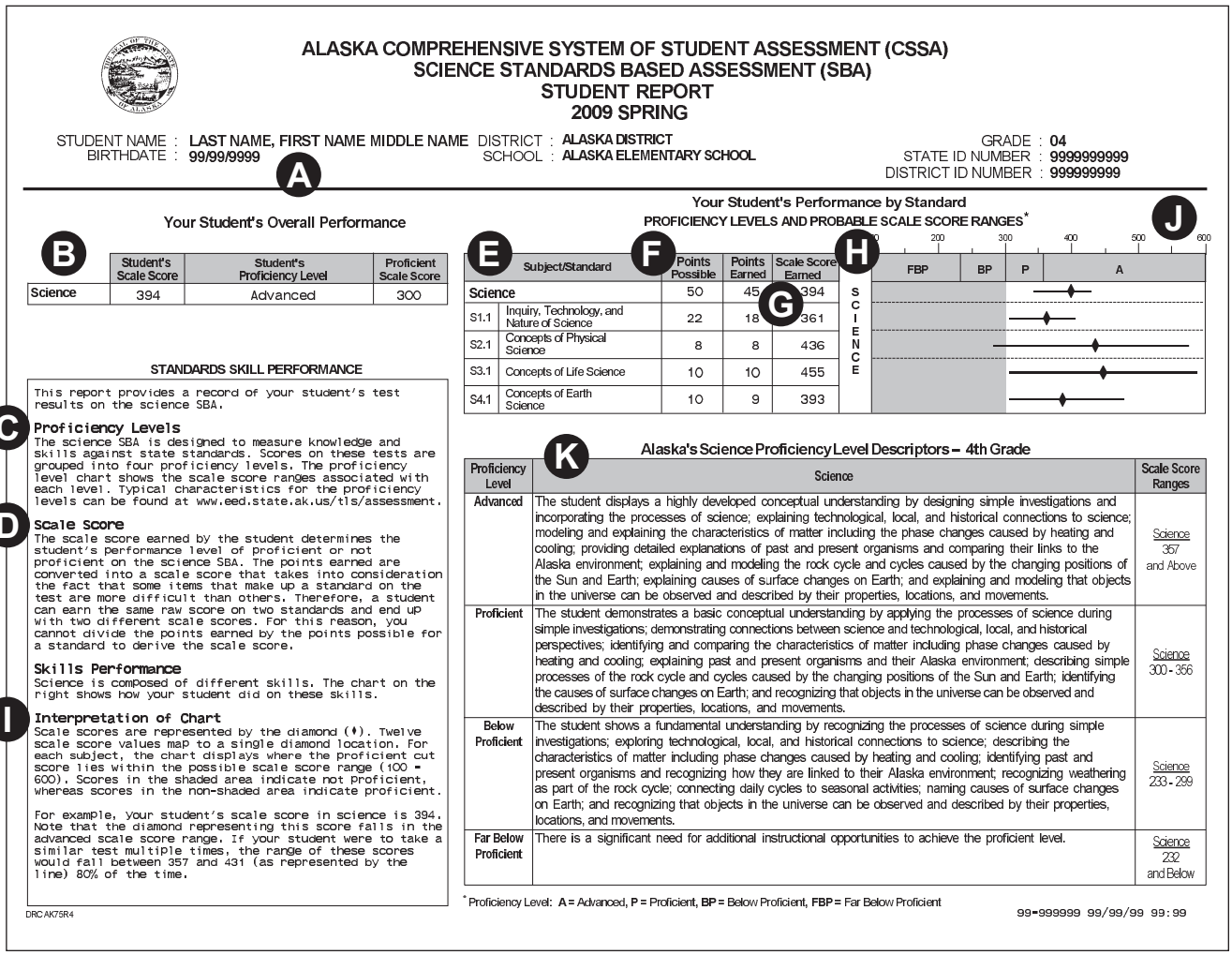
The purpose of the Standards Based Assessment (SBA) is to (a) determine on a statewide basis the extent to which students are meeting statewide performance standards; (b) produce statewide information that enables sound decision making by policy makers, parents, educators, and the public; and (c) provide a focus in order to improve instruction [4 AAC 06.700].

What the Science SBA Measures

The science component of the Standards Based Assessment (SBA) measures what students know and are able to do at their grade level in science as compared to the Alaska Performance Standards/Grade Level Expectations. For detailed information on the standards, please access the Department of Education & Early Development (EED) publication, *Alaska Standards: Content and Performance Standards for Alaska Students* available on the EED website at: http://www.eed.state.ak.us/standards/.

Components of the Science SBA

The science SBA was developed from a variety of written sources, and assesses the students' skills in the areas of: inquiry, technology, nature of science, physical science, life science, and earth science. The science SBA contains multiple-choice questions with four possible answer choices. These answers are machine-scored. Short- and extended-response questions allow students the opportunity to create a response to meaningful situations to demonstrate their knowledge and skill. Responses are scored by professional staff experienced in providing reliable and consistent hand scoring. Questions requiring a written response allow for full or partial credit.



ALASKA COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT (CSSA)
SCIENCE STANDARDS BASED ASSESSMENT (SBA)
STUDENT REPORT
2009 SPRING

STUDENT NAME : LAST NAME, FIRST NAME MIDDLE NAME
BIRTHDATE : 99/99/9999
DISTRICT : ALASKA DISTRICT
SCHOOL : ALASKA ELEMENTARY SCHOOL
GRADE : 04
STATE ID NUMBER : 9999999999
DISTRICT ID NUMBER : 999999999

A

Your Student's Overall Performance

B

	Student's Scale Score	Student's Proficiency Level	Proficient Scale Score
Science	394	Advanced	300

Your Student's Performance by Standard
PROFICIENCY LEVELS AND PROBABLE SCALE SCORE RANGES*

J

E F H G

Subject/Standard		Points Possible	Points Earned	Scale Score Earned
Science		50	45	394
S1.1	Inquiry, Technology, and Nature of Science	22	18	361
S2.1	Concepts of Physical Science	8	8	436
S3.1	Concepts of Life Science	10	10	455
S4.1	Concepts of Earth Science	10	9	393

SCIENCE

100 200 300 400 500 600
FBP BP P A

STANDARDS SKILL PERFORMANCE

This report provides a record of your student's test results on the science SBA.

C **Proficiency Levels**
The science SBA is designed to measure knowledge and skills against state standards. Scores on these tests are grouped into four proficiency levels. The proficiency level chart shows the scale score ranges associated with each level. Typical characteristics for the proficiency levels can be found at www.eed.state.ak.us/tls/assessment.

D **Scale Score**
The scale score earned by the student determines the student's performance level of proficient or not proficient on the science SBA. The points earned are converted into a scale score that takes into consideration the fact that some items that make up a standard on the test are more difficult than others. Therefore, a student can earn the same raw score on two standards and end up with two different scale scores. For this reason, you cannot divide the points earned by the points possible for a standard to derive the scale score.

Skills Performance
Science is composed of different skills. The chart on the right shows how your student did on these skills.

I **Interpretation of Chart**
Scale scores are represented by the diamond (♦). Twelve scale score values map to a single diamond location. For each subject, the chart displays where the proficient cut score lies within the possible scale score range (100 - 600). Scores in the shaded area indicate not Proficient, whereas scores in the non-shaded area indicate proficient.

For example, your student's scale score in science is 394. Note that the diamond representing this score falls in the advanced scale score range. If your student were to take a similar test multiple times, the range of these scores would fall between 357 and 431 (as represented by the line) 80% of the time.

DRC AK75R4

K

Alaska's Science Proficiency Level Descriptors – 4th Grade

Proficiency Level	Science	Scale Score Ranges
Advanced	The student displays a highly developed conceptual understanding by designing simple investigations and incorporating the processes of science; explaining technological, local, and historical connections to science; modeling and explaining the characteristics of matter including the phase changes caused by heating and cooling; providing detailed explanations of past and present organisms and comparing their links to the Alaska environment; explaining and modeling the rock cycle and cycles caused by the changing positions of the Sun and Earth; explaining causes of surface changes on Earth; and explaining and modeling that objects in the universe can be observed and described by their properties, locations, and movements.	Science 357 and Above
Proficient	The student demonstrates a basic conceptual understanding by applying the processes of science during simple investigations; demonstrating connections between science and technological, local, and historical perspectives; identifying and comparing the characteristics of matter including phase changes caused by heating and cooling; explaining past and present organisms and their Alaska environment; describing simple processes of the rock cycle and cycles caused by the changing positions of the Sun and Earth; identifying the causes of surface changes on Earth; and recognizing that objects in the universe can be observed and described by their properties, locations, and movements.	Science 300 - 356
Below Proficient	The student shows a fundamental understanding by recognizing the processes of science during simple investigations; exploring technological, local, and historical connections to science; describing the characteristics of matter including phase changes caused by heating and cooling; identifying past and present organisms and recognizing how they are linked to their Alaska environment; recognizing weathering as part of the rock cycle; connecting daily cycles to seasonal activities; naming causes of surface changes on Earth; and recognizing that objects in the universe can be observed and described by their properties, locations, and movements.	Science 233 - 299
Far Below Proficient	There is a significant need for additional instructional opportunities to achieve the proficient level.	Science 232 and Below

* Proficiency Level: A = Advanced, P = Proficient, BP = Below Proficient, FBP = Far Below Proficient

99-999999 99/99/99 99:99

Reading the Student Report

A Presents student demographics.

B Indicates the student's scale score and proficiency level in science.
In order to be considered proficient, the student must score on or above the Alaska Proficient Scale Score.

C Describes the proficiency levels reported in section B. Scores on the science SBA are grouped into four proficiency levels.

D Describes the scale scores reported in section B. The scale score earned by the student determines the student's performance level of advanced, proficient, below proficient, or far below proficient on the science SBA. The points earned are converted into a scale score that takes into consideration the fact that some items that make up a standard on the test are more difficult than others. Therefore, a student can earn the same raw score on two standards and end up with two different scale scores. For this reason, you cannot divide the points earned by the points possible for a standard to derive the scale score.

E Lists the Performance Standard categories.

F Lists the total points possible for the Performance Standard categories.

G Lists the points earned by the student for the Performance Standards on the science SBA. Points earned are not valid for comparisons across grades, and/or standards. The same raw score on two standards usually results in two different scale scores depending on the number of questions and the difficulty of the questions. For this reason, you cannot divide the points earned by the points possible to determine meaningful percentages.

H Lists the scale score equivalent for points earned.

I Explains the information found in the probable scale score range chart (J).

J Graphically illustrates the student's scale score (♦), the student's 80% confidence interval, and the proficiency cut score for Performance Standards and assessments.

K Describes the skills necessary for a student to be proficient, along with the range of scale scores associated with each level.

Frequently Asked Questions

Subject/Standard		Points Possible	Points Earned	Scale Score Earned
Science		**62**	**62**	**600**
A, E–G	Inquiry and Nature of Science	20	20	566
B	Concepts of Physical Science	14	14	544
C	Concepts of Life Science	16	16	567
D	Concepts of Earth Science	12	12	547

Question:

In 8th grade science, the maximum ***overall*** scale score is 600. However, the four maximum subject/standard scale scores are 566, 544, 567, and 547. How can these four numbers combine into a higher number (600) than any of the four numbers?

Answer:

It is necessary to understand the relationship between raw scores and scale scores to appreciate the seeming anomaly.

Range:

Two things, the number of items and the difficulty of the items that make up a standard, determine the ***range*** of possible scale scores.

- The longer the test, the wider the range of scale scores.
- The easier the test, the lower the maximum scale score.

- For any given person, the raw score for the total test is the sum of the raw scores for the standards, BUT the total scale score is not the sum, nor the average of the standard scale scores.
- There is no mathematical relationship between the average of the scale scores for the standards and the average overall scale score.

Impact of hard and easy items:

The relationship between raw scores and scale scores is designed to eliminate the effect of taking a hard test or an easy test, or the fact that the items from one standard may be easier than the items from another standard.

- Students would need fewer correct responses on a "harder" standard to achieve the same scale score they would get by having more correct responses on an "easier" standard.

  OR

- Answering 70% of the items correctly on a "harder" standard represents a higher level of ability than answering 70% of the items correctly on an "easier" standard.

- The raw score to scale score conversion levels the playing field, removing the impact of harder items or easier items in a given standard.
- The total test scale score is not a simple average of the standard scale scores.
  - The relationship is much too complex to be described by an average that ignores the number of items in each test and the average difficulty of the items making up that standard.

Question:

Is it possible for a student to answer all of the items correctly in a standard and not get the highest possible scale score (600)?

Answer:

Yes.

- A perfect score in a standard with easier items will translate into a lower scale score than a perfect score in a standard with harder items.
  - Both maximum scores may be less than the maximum score for the overall test.
    - This is due to the distribution of item difficulties and the number of items.
    - It is easier to answer 11 of 11 items correctly in a single standard than it is to answer 64 of 64 items correctly on the entire test.
      - The scale score for answering all of the items correctly on a standard will necessarily represent less ability than answering all of the items correctly on the overall test.
      - Although the scale score span goes from 100 to 600, it does not mean it is possible to get the highest or lowest scale score on every standard or even the overall test.