APPENDIX 11: SAMPLES OF GUIDES TO TEST INTERPRETATION

Alaska

Comprehensive System of Student Assessment (CSSA)

Guide to Test Interpretation

for the

Grade 8

Science Standards Based Assessment

For Teachers and Staff

Spring 2011

Introduction

This Guide to Test Interpretation provides an overview of reporting for the Alaska Grade 8 Science Standards Based Assessment (SBA). It is intended to help educators interpret test report data in order to better meet the needs of individual students and the district as a whole. The following information is included in this guide:

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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].

The Alaska Standards Based Assessment (SBA) is the result of intense effort and collaboration among teachers, administrators, and the Alaska State Board of Education. The proficient score on the examination was designed to reflect what students should know as a result of their public school experience.

How Results are Measured

Students are tested on the Alaska Performance Standards/Grade Level Expectations (PSGLEs) in science. The PSGLEs are aligned to the Alaska Content Standards and are statements that define what all students should know and be able to do at the end of a given grade level. Each Performance Standard/Grade Level Expectation is meant to further define a content standard. Alaska teachers developed the PSGLEs for Alaska students. 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/.

The Purpose and Usefulness of Raw Scores and Scale Scores

Raw Score

The primary indicator of performance on the science SBA is the raw score. A raw score is reported for each examinee in science. The raw score is the number of multiple-choice items answered correctly plus the number of points earned on short- and extended-response items on the science SBA. By itself, the raw score has limited utility; it can only be interpreted in reference to the total number of items on the science SBA. Raw scores cannot be compared across tests or administrations.

Scale Score

Since a given raw score may not represent the same skill level on every test form, all statewide assessment score reports include scale scores. Scale scores are statistical conversions of raw scores that adjust for slight shifts in item difficulties and permit valid comparison across all test administrations within a particular subject. The scale score range for the science SBA is from a minimum of 100 to a maximum of 600.

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When new test forms are developed, the new items will require slightly different levels of subject-area skill to answer correctly. This depends on the difficulty of the specific questions used on each form. To be fair to students, to permit valid comparison of test scores across administrations, and to maintain a consistent passing score, the skills represented by each score point must remain consistent from year to year.

As noted previously, scale scores adjust for slight shifts in underlying difficulty levels at each score point and provide valid points of comparison across all test administrations within a particular grade and subject. With scale scores, schools can compare the demonstrated knowledge and ability of different cohorts across years. Comparing scale scores on the assessments can help schools determine the impact of instruction and curriculum.

Scale Score Interpretations and Limitations

The scale scores associated with the science SBA are not equated with other grade 8 SBA examinations, even though they share a common scale score range. Therefore, interpretation of individual score differences between the assessments is inappropriate.

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.

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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	600
B	Concepts of Physical Science	14	14	600
C	Concepts of Life Science	16	16	535
D	Concepts of Earth Science	12	12	534

* This illustration is not based on the current administration.

Question:

In 8th grade science, the maximum ***overall*** scale score is 600. However, the four maximum subject/standard scale scores are 600, 600, 535, and 534. How can these four numbers combine into a higher number (600) than two 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.

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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.

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Using Results

The science SBA results and reports provide useful information for determining the performance of students in your school and classroom. This guide will also help you prepare for questions from parents, students, and other members of the educational community regarding the science SBA results.

Each report is designed to clearly present the information most useful to you and to parents and students. The audience and student populations for each of the science SBA reports are listed below.

Science SBA Report Information

Report
For Schools—Teachers and Administrators
Guide to Test Interpretation for Teachers and Staff
Guide to Test Interpretation for Parents and Students
Student Reports
School Student Roster
School Summary Report
School Subpopulation Summary Report
For Districts
Guide to Test Interpretation for Teachers and Staff
Guide to Test Interpretation for Parents and Students
Student Reports
School Student Rosters
School Summary Reports
School Subpopulation Summary Report
District School Roster
District Subpopulation Summary Report
File Layout for Student Data File
Student Data File
File Layout for Abbreviated Student Data File
Abbreviated Student Data File

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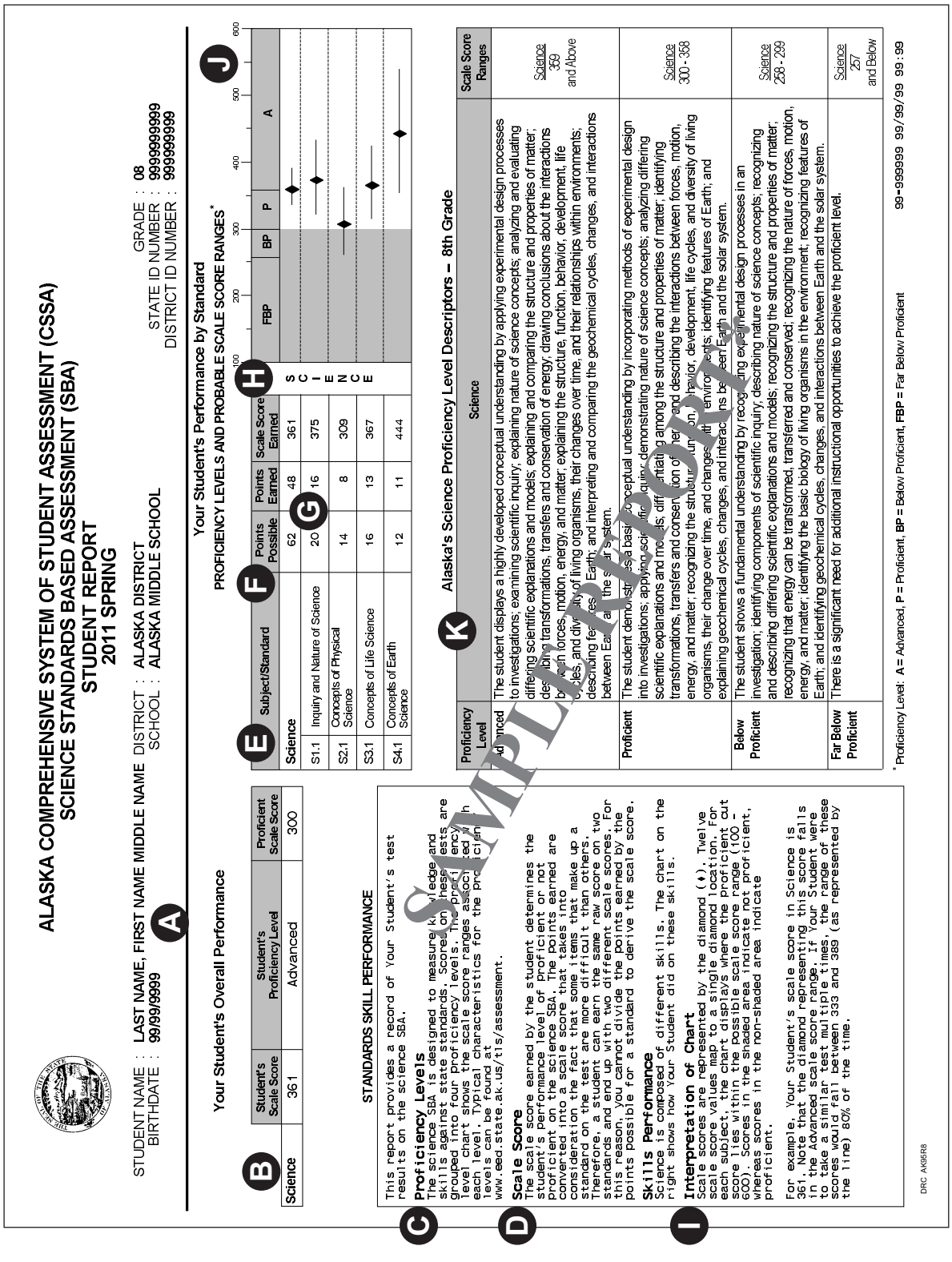
Sample Reports

Student Report



*** SAMPLE REPORT:** This sample report is not based on the current administration.

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Student Report (continued)

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 for Performance Standards and total test, and the proficiency cut score for the total test.

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

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ALASKA COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT (CSSA)
SCIENCE STANDARDS BASED ASSESSMENT (SBA)
SCHOOL STUDENT ROSTER
2011 SPRING

DISTRICT : **ALASKA DISTRICT**
SCHOOL : **ALASKA MIDDLE SCHOOL**
GROUP : **ALASKA GROUP**

STUDENT SCALE SCORE INFORMATION

This report includes summary information for each student within a school.
The report lists students alphabetically.

A Proficiency Level Range

	Science
Advanced	>358
Proficient	300-358
Below Proficient	258-299
Far Below Proficient	<258

B Science

	Proficiency Level[1]	Overall	S1.1 Inquiry and Nature of Science	S2.1 Concepts of Physical Science	S3.1 Concepts of Life Science	S4.1 Concepts of Earth Science
C State Average Scale Score		**306**	**309**	**317**	**310**	**311**
D District Average Scale Score		**321**	**326**	**337**	**325**	**322**
E School Average Scale Score		**326**	**331**	**330**	**330**	**343**
F STUDENT'S LAST, FIRST MIDDLE	A	374	344	389	378	399
STUDENT'S LAST, FIRST MIDDLE	P	334	367	244	378	358
STUDENT'S LAST, FIRST MIDDLE	A	428	430	420	476	399
STUDENT'S LAST, FIRST MIDDLE	A	[illegible]	305	389	476	325
STUDENT'S LAST, FIRST MIDDLE	FBP	235	239	153	241	295
STUDENT'S LAST, FIRST MIDDLE	BP	262	305	[illegible]	220	238
STUDENT'S LAST, FIRST MIDDLE	P	328	323	[illegible]	[illegible]	358
STUDENT'S LAST, FIRST MIDDLE	BP	299	305	315	302	267
STUDENT'S LAST, FIRST MIDDLE	BP	278	255	339	261	267
STUDENT'S LAST, FIRST MIDDLE	ABS					
STUDENT'S LAST, FIRST MIDDLE	P	316	367	339	281	267
STUDENT'S LAST, FIRST MIDDLE	P	334	305	363	349	325

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SAMPLE REPORT*

[1]Proficiency Level: **A** = Advanced, **P** = Proficient, **BP** = Below Proficient, **FBP** = Far Below Proficient, **ABS** = Absent, **INV** = Invalid, **MOD** = Modified Administration, **NOA** = Not Attempted, **PRF** = Parent Refusal, **SRF** = Student Refusal, **SUS** = Suspension

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* **SAMPLE REPORT:** This sample report is not based on the current administration.

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School Student Roster (continued)

This report includes summary information for each student within a school. The report lists students alphabetically by ascending grade.

A Indicates the proficient scale scores for the science SBA.

B Indicates the average scale score on the science SBA, as well as the average scale score by Performance Standard category for the state, district, and school. It also lists the proficiency level and scale scores in science for each student reported to the school.

C Indicates the state average scale scores for the science SBA and Performance Standards.

D Indicates the district average scale scores for the science SBA and Performance Standards.

E Indicates the school average scale scores for the science SBA and Performance Standards.

F Indicates the proficiency level and scale score by test and Performance Standard for each student reported to the school. This section may also indicate why a student did not receive a score.

- ABS = absent
- INV = invalid
- MOD = modified examination*
- NOA = test not attempted
- PRF = parent refusal
- SRF = student refusal
- SUS = suspension

***Students with disabilities cannot be denied the modification(s) their IEP teams have documented, but students can refuse the modification(s). NOTE: Modified tests are invalid and will not be scored.**

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ALASKA COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT (CSSA)
SCIENCE STANDARDS BASED ASSESSMENT (SBA)
SCHOOL SUMMARY REPORT
2011 SPRING

DISTRICT : **ALASKA DISTRICT**
SCHOOL : **ALASKA MIDDLE SCHOOL**

PAGE : **1**
GRADE : **08**

PERFORMANCE SUMMARY

This report provides an analysis of group standards mastery using the average scale score obtained for each reportable standard and details the percent of students in each proficiency level.

Proficiency Level Comparison (A)		Science (B)					
			Performance by Standard				
The proficiency level scale score ranges were developed for individual student comparisons only. These scale score ranges cannot be applied to the average scale score information for the state, district, or school. The average for a group of scores masks the distribution of scores in that group. A better way to evaluate the performance of a group is to compare the proportion of students in each performance level.		Overall	S1.1 Inquiry and Nature of Science	S2.1 Concepts of Physical Science	S3.1 Concepts of Life Science	S4.1 Concepts of Earth Science	THIS SPACE INTENTIONALLY LEFT BLANK
Points Possible (C)		**62**	**20**	**14**	**16**	**12**	
School	Average Points Earned (D)	41.6	12.7	8.4	11.0	8.5	
	Average Scale Score	326	331	330	330	343	
District	Average Scale Score (E)	321	326	337	325	322	
State	Average Scale Score (F)	306	309	311	310	311	

SAMPLE REPORT*

PROFICIENCY LEVEL SUMMARY

(G)		Science					
		Total	Advanced	Proficient	Below Proficient	Far Below Proficient	THIS SPACE INTENTIONALLY LEFT BLANK
School	Number Tested	138	43	52	27	16	
	Percent	100.0%	31.2%	37.7%	19.6%	11.6%	
District	Number Tested	690	210	203	152	125	
	Percent	100.0%	30.4%	29.4%	22.0%	18.1%	
State	Number Tested	9244	2334	2406	1969	2535	
	Percent	100.0%	25.2%	26.0%	21.3%	27.4%	

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School Summary Report (continued)

This report provides an analysis of group standards mastery using the average scale score obtained for each reportable standard and details for the percent of students in each proficiency level.

A Explains the comparison of proficiency levels.

B Lists the total points possible for the science SBA and the Performance Standard categories, as well as the average points earned for the school. It also lists the state, district, and school average scale scores for the science SBA and the Performance Standard categories.

C Lists the points possible for the science SBA and Performance Standard categories.

D Lists the average points earned and average scale score at the school level for the science SBA and Performance Standard categories.

E Lists the average scale score at the district level for the science SBA and Performance Standard categories.

F Lists the average scale score at the state level for the science SBA and Performance Standard categories.

G Lists the total number and percent of students tested, as well as the number and percent of students who were advanced, proficient, below proficient, and far below proficient in science at the school, district, and state levels.

Note: *Students who were coded absent, invalid, modified, parent refusal, student refusal, or suspension, as well as students who did not attempt the test, are not included in the summarization of results for this report.*

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School Subpopulation Summary Report

ALASKA COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT (CSSA)
SCIENCE STANDARDS BASED ASSESSMENT (SBA)
SCHOOL SUBPOPULATION SUMMARY REPORT
2011 SPRING

****NOT FOR PUBLIC DISTRIBUTION****

INFORMATION TO PROTECT SMALL NUMBERS OF STUDENTS HAS NOT BEEN SUPPRESSED.
REPORTING MAY VIOLATE INDIVIDUAL STUDENT CONFIDENTIALITY (FERPA).
THIS REPORT IS FOR INTERNAL DISTRICT USE ONLY AND FOR REQUIRED NCLB REPORTING PURPOSES.

DISTRICT: **ALASKA DISTRICT** PAGE: **1**
SCHOOL: **ALASKA MIDDLE SCHOOL** GRADE: **08**

PROFICIENCY LEVEL SUMMARY
This report provides details for the percent of students in each proficiency level.

A

		Science				
		Total	Advanced	Proficient	Below Proficient	Far Below Proficient
Non-IEP	Number Tested	122	43	46	23	10
	Percent	100.0%	35.2%	37.7%	18.9%	8.2%
IEP	Number Tested	16	0	6	4	6
	Percent	100.0%	0.0%	37.5%	25.0%	37.5%
Low Income	Number Tested	53	14	19	13	7
	Percent	100.0%	26.4%	35.8%	24.5%	13.2%
Migrant	Number Tested	2	0	1	1	0
	Percent	100.0%	0.0%	50.0%	50.0%	0.0%
Limited English Proficient	Number Tested	0	0	0	0	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%
Male	Number Tested	75	20	32	12	11
	Percent	100.0%	26.7%	42.7%	16.0%	14.7%
Female	Number Tested	63	23	20	15	5
	Percent	100.0%	36.5%	31.7%	23.8%	7.9%
African American	Number Tested	2	0	1	0	1
	Percent	100.0%	0.0%	50.0%	0.0%	50.0%
Alaska Native/American Indian	Number Tested	19	3	8	4	4
	Percent	100.0%	15.8%	42.1%	21.1%	21.1%
Asian/Pacific Islander/ Native Hawaiian	Number Tested	2	1	0	1	0
	Percent	100.0%	50.0%	0.0%	50.0%	0.0%
White (Caucasian)	Number Tested	112	38	42	21	11
	Percent	100.0%	33.9%	37.5%	18.8%	9.8%
Hispanic	Number Tested	0	0	0	0	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%
Two or more races	Number Tested	3	1	1	1	1
	Percent	100.0%	25.0%	25.0%	25.0%	25.0%

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*** SAMPLE REPORT:** This sample report is not based on the current administration.

This report provides details for the percent of students in each proficiency level in grade 8.

A Lists the total number and percent of students tested, as well as the number and percent of students who were advanced, proficient, below proficient, and far below proficient in science in a variety of demographic reporting categories at the school level.

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ALASKA COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT (CSSA)
SCIENCE STANDARDS BASED ASSESSMENT (SBA)
DISTRICT SCHOOL ROSTER
2011 SPRING

DISTRICT : **ALASKA DISTRICT**

PAGE : **1**
GRADE : **08**

SCHOOL SCALE SCORE INFORMATION
This report includes summary information for each school alphabetically within a district.

Proficiency Level Comparison (A)	Science (B)						
The proficiency level scale score ranges were developed for individual student comparisons only. These scale score ranges cannot be applied to the average scale score information for the state, district, or school. The average for a group of scores masks the distribution of scores in that group. A better way to evaluate the performance of a group is to compare the proportion of students in each performance level.	Number Tested	Overall	S1.1 Inquiry and Nature of Science	S2.1 Concepts of Physical Science	S3.1 Concepts of Life Science	S4.1 Concepts of Earth Science
State Average Scale Score (C)	**9[illegible]44**	**306**	**309**	**317**	**310**	**311**
District Average Scale Score (D)	**690**	**321**	**326**	**337**	**325**	**322**
SCHOOL NAME 1 (E)	4	[illegible]6	255	242	246	231
SCHOOL NAME 2	39	256	250	245	260	272
SCHOOL NAME 3	331	319	32[illegible]	[illegible]16	332	316
SCHOOL NAME 4	6	283	282	[illegible]301	265	282
SCHOOL NAME 5	37	335	340	33[illegible]	35[illegible]	327
SCHOOL NAME 6	14	329	363	312	[illegible]44	[illegible]312
SCHOOL NAME 7	16	329	340	313	339	[illegible]37
SCHOOL NAME 8	380	353	359	354	367	347
SCHOOL NAME 9	329	337	342	338	341	339
SCHOOL NAME 10	376	310	324	310	304	310
SCHOOL NAME 11	43	342	360	342	350	327
SCHOOL NAME 12	10	260	253	268	244	290

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District School Roster (continued)

This report includes summary information for each school alphabetically within a district.

- **A** Explains the comparison of proficiency levels.
- **B** Indicates the average scale score for the science SBA, as well as the average scale score by Performance Standard category for the state, district, and all schools in the district.
- **C** Indicates the number of students tested in the state, as well as the state average scale scores for the science SBA and Performance Standards.
- **D** Indicates the number of students tested in the district, as well as the district average scale scores for the science SBA and Performance Standards.
- **E** Indicates the number of students tested in each school, as well as the school average scale scores for the science SBA and Performance Standards.

Note: *Students who were coded absent, invalid, modified, parent refusal, student refusal, or suspension, as well as students who did not attempt the test, are not included in the summarization of results for this report.*

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District Subpopulation Summary Report

ALASKA COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT (CSSA)
SCIENCE STANDARDS BASED ASSESSMENT (SBA)
DISTRICT SUBPOPULATION SUMMARY REPORT
2011 SPRING

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DISTRICT: **ALASKA DISTRICT**

PAGE: **1**
GRADE: **08**

PROFICIENCY LEVEL SUMMARY
This report provides details for the percent of students in each proficiency level.

A

		Science				
		Total	Advanced	Proficient	Below Proficient	Far Below Proficient
Non-IEP	Number Tested	605	207	193	114	71
	Percent	100.0%	34.2%	31.9%	22.1%	11.7%
IEP	Number Tested	85	3	10	18	54
	Percent	100.0%	3.5%	11.8%	21.2%	63.5%
Low Income	Number Tested	273	62	74	62	75
	Percent	100.0%	22.7%	27.1%	22.7%	27.5%
Migrant	Number Tested	38	6	13	8	11
	Percent	100.0%	15.8%	34.2%	21.1%	28.9%
Limited English Proficient	Number Tested	14	1	0	3	10
	Percent	100.0%	7.1%	0.0%	21.4%	71.4%
Male	Number Tested	346	113	96	69	68
	Percent	100.0%	32.7%	27.7%	19.9%	19.7%
Female	Number Tested	344	97	107	83	57
	Percent	100.0%	28.2%	31.1%	24.1%	16.6%
African American	Number Tested	5	2	1	1	1
	Percent	100.0%	40.0%	20.0%	20.0%	20.0%
Alaska Native/American Indian	Number Tested	93	10	26	29	28
	Percent	100.0%	10.8%	28.0%	31.2%	30.1%
Asian/Pacific Islander/ Native Hawaiian	Number Tested	9	2	3	4	0
	Percent	100.0%	22.2%	33.3%	44.4%	0.0%
White (Caucasian)	Number Tested	552	186	170	109	87
	Percent	100.0%	33.7%	30.8%	19.7%	15.8%
Hispanic	Number Tested	17	4	2	6	5
	Percent	100.0%	23.5%	11.8%	35.3%	29.4%
Two or more races	Number Tested	13	6	1	3	3
	Percent	100.0%	46.2%	7.7%	23.1%	23.1%

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SAMPLE REPORT*

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*** SAMPLE REPORT:** This sample report is not based on the current administration.

This report provides details for the percent of students in each proficiency level in grade 8.

A Lists the total number and percent of students tested, as well as the number and percent of students who were advanced, proficient, below proficient, and far below proficient in science in a variety of demographic reporting categories at the district level.

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Science SBA Grade 8 Proficiency Level Descriptors

Advanced Level

The student

- displays a highly developed conceptual understanding by applying experimental design processes to investigations
- examines scientific inquiry
- explains nature of science concepts
- analyzes and evaluates differing scientific explanations and models
- explains and compares the structure and properties of matter
- describes transformations, transfers and conservation of energy
- draws conclusions about the interactions between forces, motion, energy, and matter
- explains the structure, function, behavior, development, life cycles, and diversity of living organisms, their changes over time, and their relationships within environments
- describes features of Earth
- interprets and compares the geochemical cycles, changes, and interactions between Earth and the solar system

Proficient Level

The student

- demonstrates a basic conceptual understanding by incorporating methods of experimental design into investigations
- applies scientific inquiry
- demonstrates nature of science concepts
- analyzes differing scientific explanations and models
- differentiates among the structure and properties of matter
- identifies transformations, transfers and conservation of energy and describes the interactions between forces, motion, energy, and matter
- recognizes the structure, function, behavior, development, life cycles, and diversity of living organisms, their change over time, and changes within environments
- identifies features of Earth
- explains geochemical cycles, changes, and interactions between Earth and the solar system

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Science (continued)

Below Proficient Level

The student

- shows a fundamental understanding by recognizing experimental design processes in an investigation
- identifies components of scientific inquiry
- describes nature of science concepts
- recognizes and describes differing scientific explanations and models
- recognizes the structure and properties of matter
- recognizes that energy can be transformed, transferred and conserved
- recognizes the nature of forces, motion, energy, and matter
- identifies the basic biology of living organisms in the environment
- recognizes features of Earth
- identifies geochemical cycles, changes, and interactions between Earth and the solar system

Far Below Proficient Level

There is a significant need for additional instructional opportunities to achieve the proficient level.

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Glossary

Constructed-Response Question

An assessment unit with directions, a question, or a problem that elicits a written, pictorial, or graphic response from a student. Sometimes called an "open-ended" item.

Content Standard

Broad statements of what students should know and be able to do as a result of their public school experience.

Forms

Different versions of a test that measure the same subject area.

Item

One of the assessment units, usually a problem or a question, in a test.

Mean

An average, calculated by adding the values of a set of scores and dividing by the number of scores in the set.

Multiple-Choice Question

A question or incomplete statement that is followed by answer choices, one of which is the correct or best answer.

Performance Standard

A statement that defines what all students should know and be able to do at the end of a given grade level.

Proficiency Level

Category that reflects a range of test scores that represents a student's current acquired knowledge and skills in the subject area.

Scale Score

Three-digit integers that provide a common metric for expressing student performance from different forms.

Standard Error of Measurement

A mathematical calculation that estimates a range within which a student's "true score" would fall, had that student taken the test numerous times. It is important to understand that all tests have an inherent measurement error because they are a sample of student performance at one particular time.

Standardized Test

A test administered in accordance with explicit directions for uniform administration.

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Alaska

Comprehensive System of Student Assessment (CSSA)

Guide to Test Interpretation for the Grade 8 Science Standards Based Assessment For Parents and Students Spring 2011

Explanation of Examinations and Scoring

The Purpose of Testing

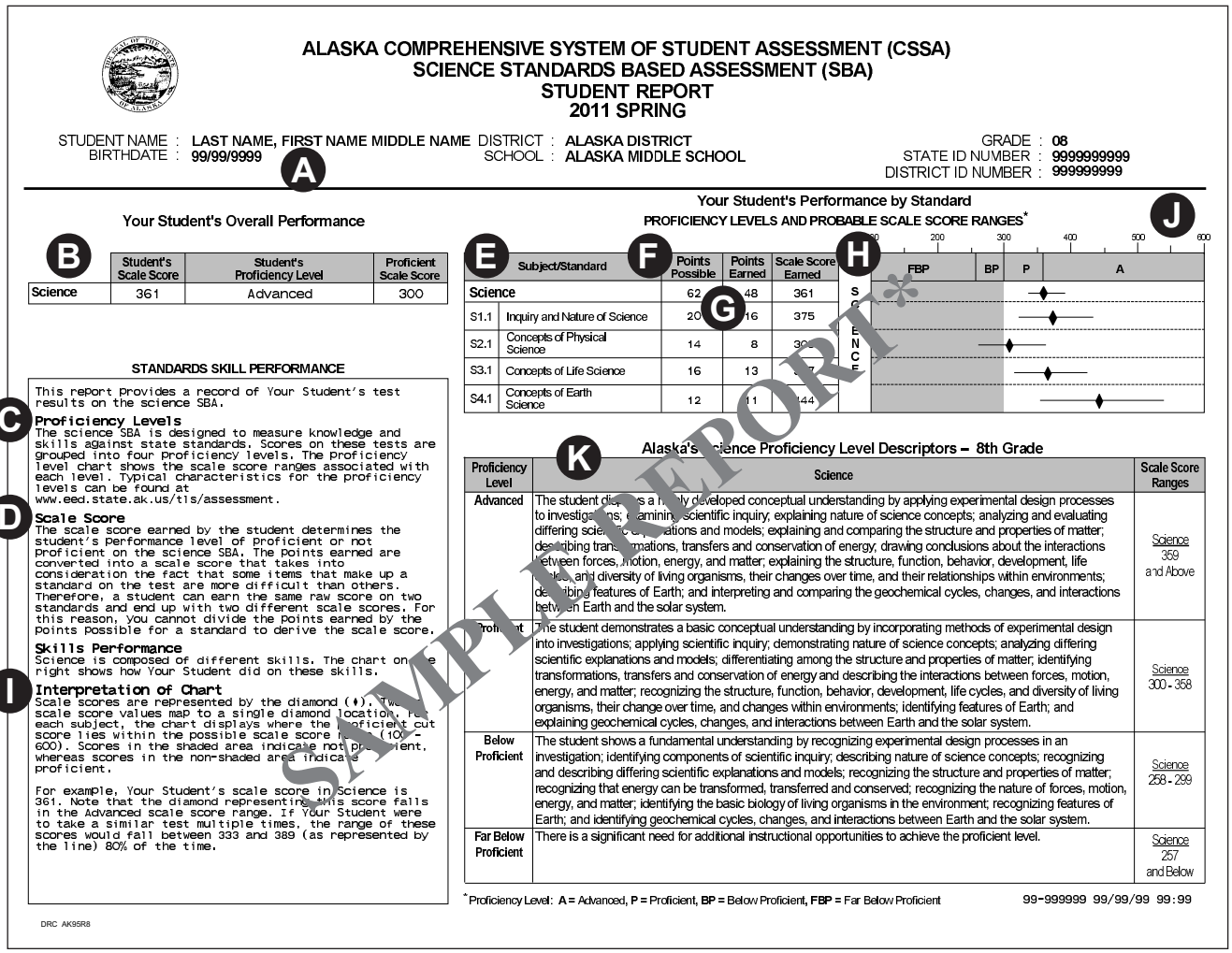
The purpose of the Standards Based Assessment (SBA) is to (a) determine on a statewide basis the extent to which students are meeting statewide performance standards; (b) produce statewide information that enables sound decision making by policy makers, parents, educators, and the public; and (c) provide 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
2011 SPRING

STUDENT NAME : LAST NAME, FIRST NAME MIDDLE NAME
BIRTHDATE : 99/99/9999
DISTRICT : ALASKA DISTRICT
SCHOOL : ALASKA MIDDLE SCHOOL
GRADE : 08
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	361	Advanced	300

STANDARDS SKILL PERFORMANCE

C

This report provides a record of Your Student's test results on the science SBA.

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 (♦). Two 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 361. 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 333 and 389 (as represented by the line) 80% of the time.

DRC AK95R8

Your Student's Performance by Standard

PROFICIENCY LEVELS AND PROBABLE SCALE SCORE RANGES*

J

E F G H

Subject/Standard		Points Possible	Points Earned	Scale Score Earned
Science		62	48	361
S1.1	Inquiry and Nature of Science	20	16	375
S2.1	Concepts of Physical Science	14	8	30
S3.1	Concepts of Life Science	16	13	
S4.1	Concepts of Earth Science	12	11	344

SCIENCE

100 200 300 400 500 600

FBP | BP | P | A

K

Alaska's Science Proficiency Level Descriptors – 8th Grade

Proficiency Level	Science	Scale Score Ranges
Advanced	The student demonstrates a highly developed conceptual understanding by applying experimental design processes to investigations; examining scientific inquiry; explaining nature of science concepts; analyzing and evaluating differing scientific explanations and models; explaining and comparing the structure and properties of matter; describing transformations, transfers and conservation of energy; drawing conclusions about the interactions between forces, motion, energy, and matter; explaining the structure, function, behavior, development, life cycles, and diversity of living organisms, their changes over time, and their relationships within environments; describing features of Earth; and interpreting and comparing the geochemical cycles, changes, and interactions between Earth and the solar system.	Science 359 and Above
Proficient	The student demonstrates a basic conceptual understanding by incorporating methods of experimental design into investigations; applying scientific inquiry; demonstrating nature of science concepts; analyzing differing scientific explanations and models; differentiating among the structure and properties of matter; identifying transformations, transfers and conservation of energy and describing the interactions between forces, motion, energy, and matter; recognizing the structure, function, behavior, development, life cycles, and diversity of living organisms, their change over time, and changes within environments; identifying features of Earth; and explaining geochemical cycles, changes, and interactions between Earth and the solar system.	Science 300 - 358
Below Proficient	The student shows a fundamental understanding by recognizing experimental design processes in an investigation; identifying components of scientific inquiry; describing nature of science concepts; recognizing and describing differing scientific explanations and models; recognizing the structure and properties of matter; recognizing that energy can be transformed, transferred and conserved; recognizing the nature of forces, motion, energy, and matter; identifying the basic biology of living organisms in the environment; recognizing features of Earth; and identifying geochemical cycles, changes, and interactions between Earth and the solar system.	Science 258 - 299
Far Below Proficient	There is a significant need for additional instructional opportunities to achieve the proficient level.	Science 257 and Below

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

99-999999 99/99/99 99:99

SAMPLE REPORT*

* **SAMPLE REPORT:** This sample report is not based on the current administration.

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 for Performance Standards and total test, and the proficiency cut score for the total test.

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	600
B	Concepts of Physical Science	14	14	600
C	Concepts of Life Science	16	16	535
D	Concepts of Earth Science	12	12	534

* This illustration is not based on the current administration.

Question:

In 8th grade science, the maximum ***overall*** scale score is 600. However, the four maximum subject/standard scale scores are 600, 600, 535, and 534. How can these four numbers combine into a higher number (600) than two 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.

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