Standard Setting Results for the Nebraska State Accountability Alternate Assessment of Science (NeSA-AAS)

Submitted by:

Susan L. Davis, Ph.D.

Brett P. Foley, Ph.D.

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NeSA-AAS (Alternate Assessment in Science) Standard Setting

Summary of Process

Nebraska Department of Education (NDE) contracted with Alpine Testing Solutions (Alpine) to conduct a standard setting workshop for the Nebraska State Accountability Alternate Assessment of Science (NeSA-AAS). Alpine worked closely with NDE to design and prepare for the standard setting which was conducted June 25, 2012 in Lincoln, NE.

NDE recruited 19 teachers and content specialists from across the state to serve as panelists. The three panels included 6 teachers on the 5th grade panel, 6 teachers on the 8th grade panel, and 7 teachers on the 11th grade panel. The meeting began with an orientation and training conducted by Alpine which introduced the panelists to the purpose of the standard setting meeting and the activities they would be engaging in during the workshop.

The first part of the workshop was spent formulating draft Performance Level Descriptors (PLDs) for each of the three NDE-defined performance level categories (Below the Standard, Meets the Standard, and Exceeds the Standard). Specifically, the panelists were tasked with identifying the skills that would be characteristic of the students within each performance category. As inputs to this process, panelists were provided (1) copies of the Science Extended Indicators, (2) the PLDs for the Math alternate assessment (as an example), and (3) the policy definition component of the PLDs for the NeSA-AAS created by NDE. These descriptors were drafted by small grade-level groups and shared and reviewed within the grade-level panels. The output of this process, revised recommended PLDs, are included in Appendix A.

During the remainder of the workshop, the panelists engaged in the operational standard setting activities where they were tasked with leveraging the PLDs to recommend cut scores on the NeSA-AAS assessments. This part of the workshop began with a practice activity whereby the panelists could become familiar with the modified (i.e., Yes/No) Angoff standard setting process utilizing pilot items that are currently embedded on the operational examination forms. After becoming comfortable with the standard setting process, panelists engaged in their operational standard setting ratings for each grade-level examination.

The operational standard setting was conducted as follows. Panelists made their initial ratings independently using their professional judgments guided by the Extended Indicators, PLDs, and the examination booklets (Administrator and Student materials). Alpine collected their initial ratings, compiled the judgments across panelists, and presented the panel with feedback including their individual recommended cut scores, the panel's recommended cut scores, the estimated difficulty of each item (p-value), and the estimated impact[1] of the panel's recommended cut scores (percentage of students in each performance category). After receiving this feedback, panelists were provided an opportunity to revise their initial ratings. The recommended cut scores presented in this report are based on the second round of ratings.

[1] The full impact by grade is included in Appendix B.

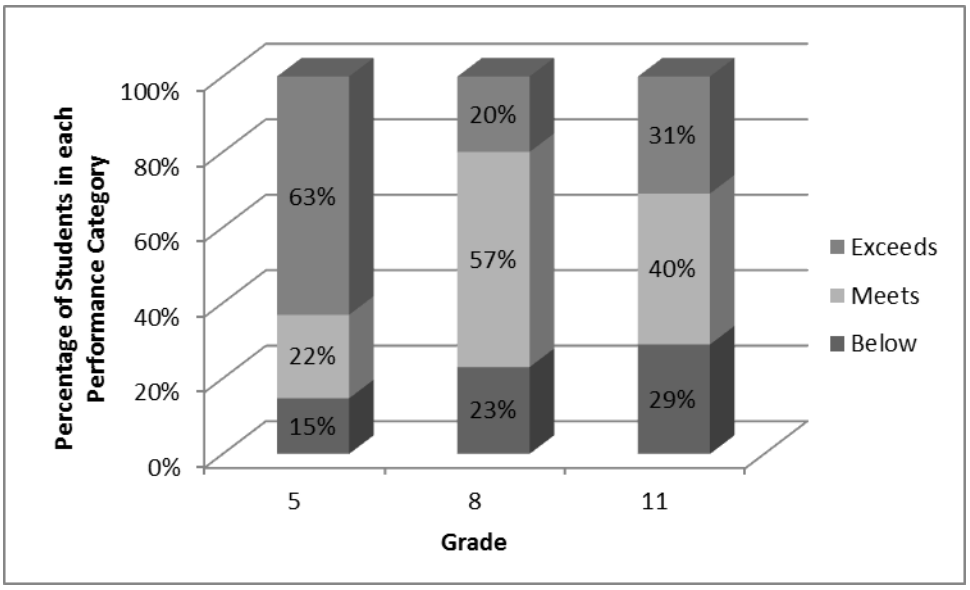
Summary of Results

The results of the second round of Angoff ratings for each grade-level are included in Table 1. Specifically, for each grade level, Table 1 includes the median Meets the Standard and Exceeds the Standard recommended cut scores, the impact associated with these cut scores (percentage of students classified within each performance category), and recommended cut ranges that represent the median cut score ± two standard errors. In these analyses the standard error is used to represent the variability among the panelist judgments. Therefore, larger ranges indicate more panel variability and smaller ranges represent more similarity within a panel. The impact of the median recommended cut scores is also presented in Figure 1.

Table 1. Median cut scores, impact, and recommended cut score ranges by grade

Grade		Below the Standard	Meets the Standard	Exceeds the Standard
5	Median		13	19
	Impact	15%	22%	63%
	Median ± 2 SE		10-15	17-21
8	Median		14	22
	Impact	23%	57%	20%
	Median ± 2 SE		12-16	19-24
11	Median		18	26
	Impact	29%	40%	31%
	Median ± 2 SE		16-20	25-27

Figure 1. Impact of median recommended cut scores



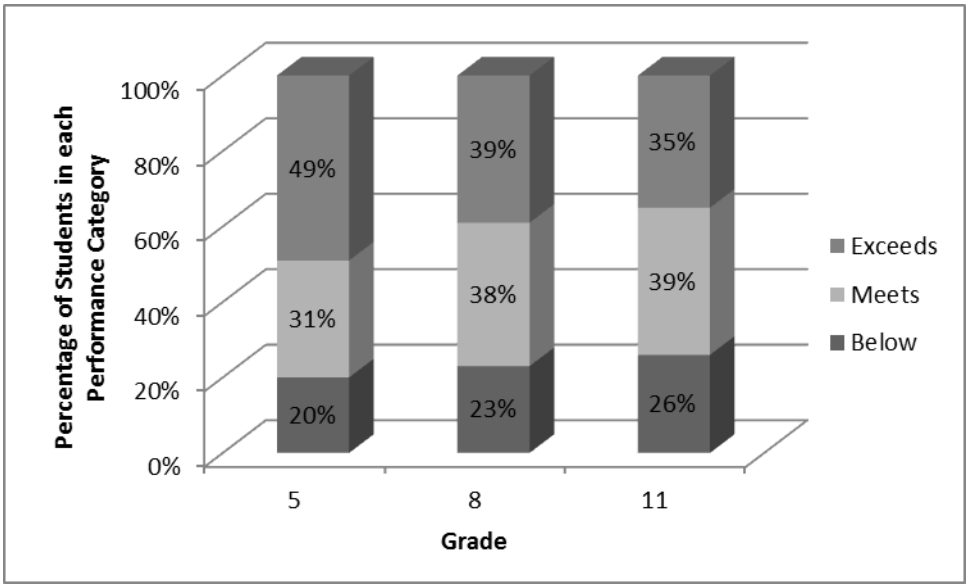
The results were further reviewed to determine if the impact (percent of students within each performance category) could be smoothed across grades while staying within the recommended cut score ranges. The

results are presented in Table 2 and the impact is presented graphically in Figure 2. These recommendations are presented to NDE for consideration.

Table 2. Recommended smoothed cut scores and impact, by grade

Grade		**Below the Standard**	**Meets the Standard**	**Exceeds the Standard**
5	Cut Score Impact	 20%	15 31%	21 49%
8	Cut Score Impact	 23%	14 38%	20 39%
11	Cut Score Impact	 26%	17 39%	25 35%

Figure 2. Impact of smoothed recommended cut scores



As a point of comparison, the impact of these smoothed recommended cut scores is presented in Appendix C alongside the impact of the 2011 recommended cut scores for the alternate assessment in Reading (NeSA-AAR) and Mathematics (NeSA-AAM).

Appendix A: Draft Performance Level Descriptors

The recommended PLDs are presented in this appendix by grade.

Nebraska State Accountability Alternate Assessment of Science (NeSA-AAS)
Performance Level Descriptors, Grade 5

Below the Standards	**Meets the Standards**	**Exceeds the Standards**
Using their primary mode of communication, appropriate supports and accommodations, the student demonstrates a basic level of understanding of extended grade-level science skills and concepts. Inaccuracies may interfere with conceptual understanding. The student may require frequent prompting in order to complete a task. • Answer/respond to an investigative question. • Indicate one physical property of matter. • Trace the movement of an object. • Identify living things versus non-living things. • Match the parent and its offspring. • Identify an object in the sky. • Identify an object on Earth. • Indicate night versus day. • Label an element of weather.	Using their primary mode of communication, appropriate supports and accommodations, the student demonstrates a consistent understanding of extended grade-level science skills and concepts. The student may require minimal prompting in order to complete a task. Inaccuracies that do not interfere with conceptual understanding may be present. • Solve a problem given a variety of possible solutions. • Identify or represent a change in one physical property of matter. • Identify a force. • Identify factors necessary to support life. • Identify growth in organisms. • Observe that the physical appearance of objects in space can change. • Indicate the type of weather. • Indicate characteristics of each season.	Using their primary mode of communication, appropriate supports and accommodations, the student exceeds the expectation by demonstrating independent and consistent understanding of extended grade-level science skills and concepts. The student typically requires minimal or no prompting in order to complete a task. Inaccuracies that do not interfere with conceptual understanding are rarely present. • Identify the steps necessary to solve a problem. • Match an instrument with its intended purpose. • Identify the physical properties of the three states of matter. • Identify a model representing the influence of force on motion. • Demonstrate an understanding of the sun's effect on an organism's survival. • Identify threats to a plant's or animal's existence. • Explain the essential factors needed to support life. • Explain the relationship between parent and offspring. • Recognize that the Earth travels around the sun. • Identify results of weather conditions. • Identify appropriate clothing for each season.

Nebraska State Accountability Alternate Assessment of Science (NeSA-AAS)
Performance Level Descriptor, Grade 8

Below the Standards	**Meets the Standards**	**Exceeds the Standards**
Using their primary mode of communication, appropriate supports and accommodations, the student demonstrates a basic level of understanding of extended grade-level science skills and concepts. Inaccuracies may interfere with conceptual understanding. The student may require frequent prompting in order to complete a task. • Identify a wheel and/or inclined plane • Match a solid to its liquid state • Identify common sources of light • Recognize the human brain, heart, and lungs • Match parent to offspring • Recognize the earth, moon, and sun in various representations	Using their primary mode of communication, appropriate supports and accommodations, the student demonstrates a consistent understanding of extended grade-level science skills and concepts. The student may require minimal prompting in order to complete a task. Inaccuracies that do not interfere with conceptual understanding may be present. • Select a simple machine to solve a common problem • Recognize basic organs and identify their functions • Identify adaptations that help an organism survive in a given environment • Recognize if an organism is a producer or a consumer within an ecosystem • Identify the relationship of the earth to the sun and moon • Recognize common changes in the physical properties of matter	Using their primary mode of communication, appropriate supports and accommodations, the student exceeds the expectation by demonstrating independent and consistent understanding of extended grade-level science skills and concepts. The student typically requires minimal or no prompting in order to complete a task. Inaccuracies that do not interfere with conceptual understanding are rarely present. • Determine which simple machine would best solve a problem • Explain the reason(s) for an organism's ability or inability to survive in a given environment • Determine the missing element(s) in the flow of matter/energy of a given ecosystem • Order the planets of the solar system according to their distance from the sun • Identify and compare differences between revolution and rotation • Apply appropriate procedures to change water from solid to liquid to gas

Nebraska State Accountability Alternate Assessment of Science (NeSA-AAS)
Performance Level Descriptor, Grade 11

Below the Standards	**Meets the Standards**	**Exceeds the Standards**
Using their primary mode of communication, appropriate supports and accommodations, the student demonstrates a basic level of understanding of extended grade-level science skills and concepts. Inaccuracies may interfere with conceptual understanding. The student may require frequent prompting in order to complete a task. • Participate in an investigation by following a one-step direction • Points to common items in the world in which they live • Sequences the changes that take place in the states of matter (e.g., water + cold temp <32 degrees = ice) • Matches an object to an illustrated replica of the same object (e.g., a real battery to a picture of a battery) • Recalls or recognizes a basic fact about the world in which they live.	Using their primary mode of communication, appropriate supports and accommodations, the student demonstrates a consistent understanding of extended grade-level science skills and concepts. The student may require minimal prompting in order to complete a task. Inaccuracies that do not interfere with conceptual understanding may be present. • Reads simple bar graphs and pie charts • Determines appropriate terms when searching for investigative questions (through technology or texts) • Recognizes actions and reactions (heat transfer, motion, movement transfer) • Identifies physical traits that are inherited (e.g., hair color, eye color) • Recognizes the difference between man-made and natural objects	Using their primary mode of communication, appropriate supports and accommodations, the student exceeds the expectation by demonstrating independent and consistent understanding of extended grade-level science skills and concepts. The student typically requires minimal or no prompting in order to complete a task. Inaccuracies that do not interfere with conceptual understanding are rarely present. • Researches a question (through technology or texts) • Interpret simple bar graphs and pie charts • Analyzes changes occurring in matter and forces acting on matter • Understands the basic components of recycling living and non-living materials. • Predicts what physical traits may be inherited (e.g., brown hair, blue eyes)

Appendix B: Exam Performance by Grade

The table below shows the percent of students, by grade, who scored at or above each raw score on the NeSA-AAS exam in 2012.

Score	Grade 5	Grade 8	Grade 11
0	100%	100%	100%
1	98%	100%	99%
2	97%	99%	99%
3	97%	99%	99%
4	97%	98%	99%
5	97%	98%	99%
6	96%	97%	99%
7	96%	96%	98%
8	95%	95%	97%
9	94%	92%	96%
10	92%	91%	96%
11	91%	87%	93%
12	87%	85%	89%
13	85%	80%	85%
14	82%	77%	83%
15	80%	71%	78%
16	76%	66%	76%
17	71%	59%	74%
18	67%	53%	71%
19	63%	46%	66%
20	57%	39%	62%
21	49%	30%	60%
22	43%	20%	56%
23	31%	11%	49%
24	16%	6%	41%
25	5%	1%	35%
26			31%
27			24%
28			16%
29			8%
30			4%

Appendix C: Comparison of Preliminary NeSA-AAS results to Impact of Results from 2011 NeSA-AAR and NeSA-AAM Standard Settings

The impact of the preliminary recommended cut scores from the NeSA-AAS standard setting (soothed cut scores, Table 2) is presented in Table C-1 below alongside the impact of the recommended cut scores from the 2011 NeSA-AAR and NeSA-AAM standard setting. These results are also presented graphically in Figure C-1.

Table C-1. Impact of recommended cut scores for NeSA-AAR (2011), NeSA-AAM (2011) and NeSA-AAS (2012) by grade

Grade - Subject	Below the Standard	Meets the Standard	Exceeds the Standard
5 - Reading	31%	29%	40%
5 - Math	34%	39%	27%
5 - Science	20%	31%	49%
8 - Reading	30%	32%	38%
8 - Math	35%	37%	28%
8 - Science	23%	38%	39%
11 - Reading	30%	35%	35%
11 - Math	39%	36%	25%
11 - Science	26%	39%	35%

Figure C-1. Impact of recommended cut scores for NeSA-AAR (2011), NeSA-AAM (2011) and NeSA-AAS (2012) by grade