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Executive Summary

As part of the revision of the Nebraska Science Standards, which began in the fall of 2016, a public input survey was developed to obtain feedback from key stakeholders like educators, parents, students, and the general public. The online survey was launched on May 5, 2017 and distributed via several channels including the NDE website, and social media and news outlets. The survey closed on June 23, 2017.

This executive summary highlights several key findings:

1. Among the 705 respondents who provided input on the science standards, 63% (N = 446) of them identified themselves as educators, and 21% (N = 149) as parents/guardians.

2. In measuring the quality of the standards based on NDE’s identified characteristics, the following results were found:
   - About 91% of respondents indicated that the science standards are appropriately challenging.
   - About 90% of respondents indicated that the science standards are connected.
   - About 90% of respondents indicated that the science standards are clearly worded.
   - About 91% of respondents indicated that the science standards are specific.

3. Recommendations provided for a system of assessments revealed the importance of the assessments needing to match the standards’ focus on student performance, understanding, and skill, and not just knowledge of content.

4. Approximately 80% (N = 45) of educators selected the Nebraska model as the most appropriate scaffolded progression of student learning.

5. About 88% (N = 310) of respondents agree that the standards reflect the essential knowledge and skills that students need relative to science education.

6. From the open-ended comments (N = 169) provided on the science standards, almost 30% (N = 49) of them showed great support and appreciation for the revised science standards.

7. Over 50% (N = 87) of the open-ended comments reflected the desire for modifications on the design, content, and wording of the science standards.

8. Some comments (N = 44) hinted at the importance of providing training, tools, and support for teachers in order to appropriately teach students as the revised science standards are adopted.
Overall Summary

Before the results for each grade level are presented, this section provides the results collected on the science standards as a whole.

Measurable

“What recommendations do you have for a system to support these science standards?”

The open-ended responses provided by educators (N = 85) on the measurability of the science standards reflected the following recommendations:

- Standardized state assessments should not solely be summative. Instead, there should be more assessments that are formative. In using a variety of testing methods, students across various grade levels should be asked to demonstrate learning through a series of experiments or projects.
- Assessments should be conducted at every grade level. While some respondents have suggested conforming to state assessments, others have felt that they should be locally developed.
- Rubrics should be created around assessments and used by teachers for evaluation purposes. It was recommended that clear rubrics should also be in place for assessing research and exploratory projects.
- More quantitative or data analysis problems should be incorporated into the science standards. There were also suggestions to include real-world applications of the standards to better prepare students for life outside of school.

Please see the Appendix for actual comments provided in response to this question.

Scaffolded

“Which arrangement of the topics do you think is most appropriate for Nebraska students?”

Approximately 80% of educators selected the Nebraska model as the most appropriate scaffolded progression of student learning, as shown in Figure 1. The remaining 20% of educators chose the Framework model.
Figure 1. Frequency of each model selected to reflect the best progression of student learning.

![Bar chart showing Nebraska Model and Framework Model frequencies.]

**Essential Knowledge and Skills**

“Do you agree or disagree that these standards reflect the essential knowledge and skills that students need (i.e., what students are expected to know and do) relative to science education?”

Figure 2 reveals that 88% of respondents either somewhat or strongly agreed that the science standards reflect the essential knowledge and skills needed by students. Only 6% of respondents indicated their disagreement with the standards reflecting what students are expected to know and do.
Figure 2. Breakdown of responses reflecting varying levels of agreement.

Content Analysis

“Do you have any final thoughts on the science standards?”

Final thoughts on the science standards were provided by 169 respondents. In order to meaningfully understand the comments, each comment was read and subsequently coded into one or more themes. The frequency of the resulting 9 themes are shown in Figure 3.
There were a total of 49 respondents who were satisfied with the revised Nebraska Science Standards, as indicated by the theme “Good Standards.” Apart from that, the four issues most commented on were the standards design, impact on students, impact on teachers, and standards wording. In the comments surrounding the design of the standards, the content and implementation of the standards appeared to be a concern for almost half of all respondents who provided their thoughts. In the comments reflecting the theme “Impact on Students,” certain science topics were found to be too challenging and inappropriate for students in the designated grade level. According to the comments on the impact on teachers, additional training, time, and support were requested to help teachers effectively teach the revised science standards. Last, clearer interpretation and/or language of specific parts of the standards was demanded to help both teachers and students alike to better grasp the science topics.
Kindergarten
This section presents the results obtained for the Kindergarten science standards. About 14% of all respondents to the Science Standards survey provided input for Kindergarten.

Figure 4. Breakdown of survey respondents to the Kindergarten standards.

High-Quality Content Standards
Respondents provided feedback on four high-quality content standards, as identified by NDE (see here for more information on the standards). These four standards or characteristics are (1) appropriately challenging, (2) connected, (3) clearly worded, and (4) specific. For each topic, the quality of the standards is measured by 5-point Likert scale questions. The five levels of responses are collapsed into three levels of responses for the purposes of this report. The following figures display the percentage breakdown of responses to each standard, for each topic. Note that only educators and postsecondary representatives were asked for input on the (3) clearly worded and (4) specific standards.
Figure 5. Responses to K.1 Forces and Interactions: Pushes and Pulls.

### K.1 Forces and Interactions: Pushes and Pulls

<table>
<thead>
<tr>
<th>Specific</th>
<th>Clearly Worded</th>
<th>Connected</th>
<th>Appropriately Challenging</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>96%</td>
<td>82%</td>
<td>96%</td>
</tr>
<tr>
<td>=</td>
<td>2%</td>
<td>10%</td>
<td>1%</td>
</tr>
<tr>
<td>-</td>
<td>2%</td>
<td>8%</td>
<td>3%</td>
</tr>
</tbody>
</table>

- Appropriately challenging/Connected/Clearly worded/Specific
- Neither appropriate nor inappropriate/Neither connected nor disconnected/Neither clearly worded nor unclearly worded/Neither specific nor unspecific
- Inappropriate/Disconnected/Unclearly worded/Unspecific
Figure 6. Responses to K.2 Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environments.

<table>
<thead>
<tr>
<th>Specific</th>
<th>Clearly Worded</th>
<th>Connected</th>
<th>Appropriately Challenging</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>96%</td>
<td>80%</td>
<td>91%</td>
</tr>
<tr>
<td>=</td>
<td>4%</td>
<td>16%</td>
<td>3%</td>
</tr>
<tr>
<td>-</td>
<td>0%</td>
<td>4%</td>
<td>6%</td>
</tr>
</tbody>
</table>

+ Appropriately challenging/Connected/Clearly worded/Specific
= Neither appropriate nor inappropriate/Neither connected nor disconnected/Neither clearly worded nor unclearly worded/Neither specific nor unspecific
- Inappropriate/Disconnected/Unclearly worded/Unspecific
Figure 7. Responses to K.3 Weather and Climate.

<table>
<thead>
<tr>
<th>Specific</th>
<th>Clearly Worded</th>
<th>Connected</th>
<th>Appropriately Challenging</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>95%</td>
<td>77%</td>
<td>92%</td>
</tr>
<tr>
<td>=</td>
<td>5%</td>
<td>19%</td>
<td>3%</td>
</tr>
<tr>
<td>-</td>
<td>0%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

+ Appropriately challenging/Connected/Clearly worded/Specific
= Neither appropriate nor inappropriate/Neither connected nor disconnected/Neither clearly worded nor unclearly worded/Neither specific nor unspecific
- Inappropriate/Disconnected/Unclearly worded/Unspecific
Words of Interest
Follow-up questions were presented to respondents who indicated some form of dissatisfaction with the topic. For example, if a respondent either selected “Somewhat inappropriate” or “Very inappropriate” for any of the topics, the respondent had the opportunity to highlight specific words of each topic indicator that they found inappropriate.

In order to draw meaningful conclusions from the responses to these types of questions, only words with frequency counts of more than 5% (of all responses to the grade) are presented as words of interest.

In the analyses of highlighted words for Kindergarten, none of the words met the 5% threshold. Hence, no meaningful conclusion can be drawn.

Nebraska-Specific Context
Respondents had the opportunity to provide input on how the integration of Nebraska-specific context into the Kindergarten standards can be done. Their input is listed below for each of the following Kindergarten topics.

K.1 Forces and Interactions: Pushes and Pulls
1. Different stories
2. farming
3. For kindergarten I think they need a lot of hands on learning.
4. Nebraska agriculture - tractors pulling farm implement equipment like planters through a field.
5. Outdoor education shows the forces of nature.
6. Union Pacific Railroad examples
7. Using district-wide Science curriculum
8. Using our curriculum
9. Using our science curriculum

K.2 Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment
1. Animals that they can find in Nebraska... Cranes
2. Arbor Day
3. Arbor Day.
4. Crop rotation, cattle grazing, and river/stream conservation.
5. Different stories
6. farming and wildlife
7. Going outside helps the learning of these factors.
8. Growing something in the class, some sort of virtual learning, field to farms to learn about the crops!
9. importance of agriculture and plants grown here
10. Introduce Nebraska animals and habitats.
11. Learn about specific plants, animals, etc. that are native to Nebraska or that cannot survive in our climate.
12. Nebraska specific plants and environment
13. Nebraska's state animal, bird and plant / Our environment compared to other states
14. Plants and animals from Nebraska
15. Sandhill Cranes
16. Sandhill Cranes and their migration route
17. Specific animals living in Nebraska that are not found in some other areas such as some types of birds or other wildlife. Can talk about the rivers and lakes and the animals living in those ecosystems along with animals living in the country that cannot be found within the city limits.
18. Talking about what kinds of animals, plants are native to Nebraska. Talking about prairie, sand hills, buttes -- different Nebraska landscapes
19. There could be discussions on the needs of cattle and other animals raised for food in the state.
20. Using district-wide Science curriculum
21. Using our science curriculum
22. wildlife of Nebraska (Raptor Recovery of NE, Nebraska Wildlife Rescue and Rehab)
23. You could use images from the time-lapse photography of the local rivers to show changes over time and ask them to make future predictions based on different scenarios

K.3 Weather and Climate
1. All seasons can be observed in Nebraska. I think it is good for students to see that in Nebraska not all seasons are exactly the way they are suppose to be. Sometimes in winter, it doesn't know until later in the year, other times it snows earlier in the year. It is nice for students to be aware of how the seasons are still occurring even if sometimes the weather does not exactly match the description of that season (ex. it is spring, yet 70+ degrees in Nebraska at times while other days are below 30 degrees).
2. Based on our region
3. Could include natural disasters from Nebraska for example the tornado in GI in 1980. Learning about weather that affected our state.
4. Daily weather patterns, climates between western and eastern Nebraska.
5. Different stories
6. effect of the wind/storms we have here; graphing daily weather to compare/contrast week-to-week, month-to-month and season-to-season.
7. Have the students watch the weather as homework! Have a weatherman come to talk to the students!
8. Introduce the specific weather situations that happen in Nebraska.
9. Missouri River
10. Much discussion can be done on Nebraska's weather, including it's climate. We have seasonal weather, which makes this easy for students to experience.
11. Nebraska severe weather
12. Nebraska specific weather
13. Nebraska weather and seasons
14. Nebraska weather connections
15. Nebraska weather is always changing
16. Our climate of the Plains.
17. Same, I use outdoor education to teach about many skills and the environment through all seasons.
18. Severe Weather in Nebraska: tornados/blizzards/drought
19. Talk about the Ag economy in Nebraska and how the weather affects farming. Introduce concept of wind, wind farms, etc.
20. Talk about the different seasons Nebraska has.
21. Tornados
22. Using district-wide Science curriculum
23. Using our science curriculum
24. Weather graph of our weather compared to another state
25. Weather safety (tornados, hail, blizzards)
26. With the increase in the usage of solar panels around Nebraska, comparisons between there structure for shade and its effect could be compared with the effect the solar panels have on the sediment they cover.
27. You could talk about the Dust bowl and the trees that were planted to combat it and provide shade