ILLINOIS STATE BOARD OF EDUCATION MEETING
April 17, 2019

TO: **Illinois State Board of Education**

FROM: **Dr. Carmen I. Ayala, State Superintendent of Education**
Ralph Grimm, Advisor

Agenda Topic: **Illinois Science Assessment Blueprint**

***Materials*: Report from the Illinois Science Assessment Steering Committee**

***Staff Contact(s)*: Mary Reynolds, Executive Director, Innovation and Secondary Transformation**
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Purpose of Agenda Item

The Assessment and Accountability Division requests the Board to authorize the State Superintendent to approve the proposed science assessment blueprint[1] at grades 5, 8, and 11 for a fully redesigned Illinois Science Assessment (ISA). This blueprint represents a set of principles and design constraints for the assessment and will serve as the foundation for science assessment item-writing and test development for school year 2019-20 and future years of better aligned assessment administration.

Relationship to the State Board's Strategic Plan and Implications for the Agency and School Districts

The blueprint being proposed is for the Illinois Science Assessment. There is no direct mention of science in the agency's goals; however, a students are expected to demonstrate competency in science in order to graduate from high school ready for college and career.

Every child in each public school system in the State of Illinois deserves to attend a system wherein…

- Ninety percent or more of students graduate from high school ready for college and career.

Approval of this blueprint will enable ISBE to move forward with test development in ways that produce results that are more useful to educators and parents. The blueprint is developmentally appropriate for students and will help Illinois meet federal accountability assessment requirements. This decision would impact the approximately 440,500 students who would take the redesigned assessment each year -- approximately 147,500 students each in grades 5 and 8 and approximately 145,500 students in grade 11, as well as all students who benefit from Title I funds.

Background Information

In 2014, Illinois adopted the Illinois Learning Standards for science, which are based on Next Generation Science Standards (NGSS). The standards envision science performance

[1] A test blueprint defines the coverage of standards on a test, often communicated as a number or percentage of test items per standard or domain.

expectations as the ability to employ disciplinary core ideas, scientific and engineering practices, and cross-cutting concepts to solve scientific problems.

Test blueprints represent a series of intentional decisions and negotiations about what is important to assess on and how best to do it. This blueprint represents a shared set of principles and design constraints developed by the Illinois Science Assessment Steering Committee (ISASC) [2]. The committee is highly diverse, composed of 59 members representing nationally recognized science and assessment experts, original NGSS contributors, statewide school and district administrators, curriculum and instruction leaders, teachers, higher education, ISBE, and not-for-profit organizations related to science and the NGSS.

The work of the ISASC in this memo is incredibly timely. On January 3, 2019, Illinois received its peer review findings. As expected[3], the ISA administered in 2015-18 did not meet the federal assessment requirements, and the U.S. Department of Education (ED) stated that ISBE must have *a new or substantially revised general science assessment in the 2019-20 school year*. The work of the ISASC is directly aligned to federal assessment peer review requirements and reflects the values and expertise of Illinois science practitioners. Approval of this blueprint will enable ISBE to comply with this directive.

In recent conversations with ED about how best to remedy the finding, ED expressed support for the general structure of the proposed blueprint. The department encouraged ISBE to collaborate with other states to license existing items that meet the specifications of the committee-developed blueprint while ISBE builds its own bank of state-developed items. The recommendation ensures Illinois has continuous science results for use in our accountability system and complies with the requirement to annually assess science, while honoring and implementing the work of the committee. Adoption of this blueprint at this time ensures compliance during the review of the entire state assessment system included in the requested P-12 Assessment Alignment Evaluation.

The redesigned science test will measure the full range of the Illinois Learning Standards for science, but will not assess every performance expectation on any one test. Performance expectations representing all three science disciplines and all eight Science and Engineering Practices (SEPs) will be sampled to fill the blueprint. The committee's blueprint emphasizes the standard's cross-cutting focus on science disciplines and practices. Tables 1 and 2 are the proposed blueprints[4], showing the range of items on each test aligned to either a discipline or

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[2] The work of the committee and the blueprint are described at a high level in this memo. Attachment A provides a full description of the committee's work and more detailed descriptions of the blueprint, item specifications, and test structure.

[3] ED cited ISBE on April 20, 2015, for failure to administer a science assessment and placed the state's Title I Part A funds on "high risk" status. ISBE entered into an item-sharing agreement with the Office of the State Superintendent in the District of Columbia, but ED did not approve ISBE's plan until late fall of the 2015-16 school year because the administration of an end-of-course biology assessment in high school would not fully meet the federal testing requirements. Approval was granted in light of the Illinois budget crisis; however, the lack of a state budget at the time significantly delayed ISBE's ability to enter into contracts with vendors to create and administer the ISA.

[4] There is combined, a two-dimensional representation of Tables 1 and 2 in the full report that better reflects the consensus of the committee on the dimensionality of the blueprint. However, there were concerns that the detailed specification of items Table 3's cells might limit the item writing and forms construction process. To provide additional flexibility during the development process, the third table was collapsed into Tables 1 and 2.

one of three sets of SEPs. The blueprint is further divided by question type. It separates questions with a clear right and wrong answer and questions with multiple right answers and degrees of "correctness[5]." The difference in question type impacts item-writing and test construction.

Table 1. Test Blueprint by Discipline

Reporting groups		Grade 5: 1 correct	Grade 5: 1+ correct	Grade 8: 1 correct	Grade 8: 1 correct	Grade 11: 1 correct	Grade 11: 1 correct
Engineering Technology Application Science	Physical Science	13-16	3-6	13-16	3-6	15-21	3-6
	Life Science	13-16	3-6	13-16	3-6	15-21	3-6
	Earth and Space Science	13-16	3-6	13-16	3-6	15-21	3-6
Total Items in Test		**40-45**	**12-15**	**40-45**	**12-15**	**50-60**	**12-15**

Table 2. Test Blueprint by Science and Engineering Practice Set

Reporting groups		Grade 5: 1 correct	Grade 5: 1 correct	Grade 8: 1 correct	Grade 8: 1 correct	Grade 11: 1 correct	Grade 11: 1 correct
Cross Cutting Concepts	Total Items for SEP Set 1	14-18	4-6	14-18	4-6	17-23	4-6
	Total Items for SEP Set 2	14-18	4-6	14-18	4-6	17-23	4-6
	Total Items for SEP Set 3	11-13	3-4	11-13	3-4	12-18	3-4
Total Items in Test		**40-45**	**12-15**	**40-45**	**12-15**	**50-60**	**12-15**

Note: Tables 1 and 2 represent different mappings of the same set of multi-dimensional items. Their total rows count the same sets of items and should not be added together.

The blueprint is intended to provide a score to individual students and parents that represents a student's performance on all dimensions of the range of NGSS standards from grades K-5, 6-8, and 9-11. The blueprint is designed to provide -- at the school or district level, depending on the number of students tested -- six sub-scores[6] that represent student performance in the aggregate: one sub-score for each science discipline and one sub-score for each set of SEPs.

Financial Background

No new funds are being requested to support this work. The financial background of this contract/grant is illustrated in the table below:

[5] See the attached report for a more detailed description of items with 1 correct answer (i.e., dichotomous) and multiple correct answers (i.e., non-dichotomous items), as well as other relevant item specifications

[6] The committee agreed that it would be ideal to report out on each SEP individually; however, the number of test questions needed to achieve a sufficient level of reliability makes this level of reporting impractical at this time. Over time, given sufficient development of the item bank, designs that would support reporting on each SEP individually will be revisited.

	Current Contract State Funding	Current Contract Federal Funding		Requested Additional State Funding	Requested Additional Federal Funding	Total Contract per Fiscal Year
FY18	$1,733,134	$286,036				**$2,019,170**
FY19	$2,448,975	$2,448,975		$0	$0	**$4,897,950**
FY20	$2,481,310	$2,481,310		$0	$0	**$4,962,620**
FY21	$2,250,000	$2,250,000		$0	$ 0	**$4,500,000**
FY22	$2,250,000	$2,250,000		$0	$ 0	**$4,500,000**
Total	**$11,163,419**	**$9,716,321**				**$20,879,740**

Analysis and Implications for Policy, Budget, Legislative Action, and Communications

Policy Implications: The ISA is a required federal accountability assessment under the Every Student Succeeds Act. Failure to comply with the ED directive that ISBE must have a new or substantially revised general science assessment in place to begin administering in the 2019-20 school year will put approximately $675 million of federal funds at risk.

Budget Implications: This work has been envisioned and budgeted for in previous fiscal years. Approval of this blueprint does not impact that budgeting. The funding source is a combination of federal assessment funds and the state Student Assessment line item.

Legislative Action: No legislative action is needed.

Communication: After Board approval, ISBE will begin recruiting collaborators to develop additional test specification documents, develop a curriculum for training item writers, facilitate item-writing sessions, and train a pool of item writers across the state. The committee will continue to meet to discuss broad communication plans and develop specific supporting documents to implement over the next year regarding the development of the redesigned ISA.

Pros and Cons of Various Actions

Pros: This blueprint will improve science assessment by providing administrators and teachers useful information about student science competency. Providing better information to educators and administrators will help improve science learning throughout the state for the greatest number of students in the most significant ways. Approval of this blueprint will enable the timely training of item writers and timely item-writing in order to implement a high-quality science assessment for field testing in the 2019-20 school year. This will allow us to comply with federal requirements to field a new or substantially revised general science assessment in the 2019-20 school year and will be constructive to the requested P-12 Assessment Alignment Evaluation..

Cons: Delay in approval of this blueprint will delay recruitment and training of item writers and delay development of items. This places ISBE at risk of being out of compliance with the ED directive that ISBE must have a new or substantially revised general science assessment in place to begin administering in the 2019-20 school year. This places receipt of Title I Part A funding, which in 2019 was approximately $675 million, at risk.

Superintendent's Recommendation

I recommend that the following motion be adopted:

> The State Board of Education hereby authorizes the State Superintendent to adopt the proposed blueprint that guides the development of the next iteration of the Illinois Science Assessment.

Next Steps

Upon Board authorization, agency staff will begin recruiting collaborators to develop additional test specification documents, develop a curriculum for training item writers, facilitate item-writing sessions, and train a pool of item writers across the state. The committee will continue to meet to discuss broad communication plans and develop specific supporting documents to implement over the next year regarding the development of the redesigned ISA.