SCHOOL BOARD ACTION REPORT

DATE: April 5, 2020
FROM: Denise Juneau, Superintendent
LEAD STAFF: MaryMargaret Welch, Science Program Manager (mmwelch@seattleschools.org)
Caleb Perkins, Executive Director, College and Career Readiness (cbperkins@seattleschools.org)
Cashel Toner, Executive Director, Curriculum and Instruction (cctoner@seattleschools.org)
Diane DeBacker, Chief Academic Officer (dmdebacker@seattleschools.org)

For Introduction: April 29, 2020
For Action: May 13, 2020

1. TITLE

High School Chemistry B Instructional Materials Adoption

2. PURPOSE

This Board Action will approve the recommendation of the High School Science Instructional Materials Adoption Committee for instructional materials for all students taking 11th grade Chemistry B (CHEM B).

3. RECOMMENDED MOTION

I move that the Seattle School Board approve the recommendation of the Instructional Materials Committee to adopt the selection of the High School Science Adoption Committee to adopt the CHEM B instructional materials, developed by Seattle Public Schools in collaboration with university partners, as core instructional materials for Seattle Public Schools' high school Chemistry B (CHEM B) science classrooms.

I further move that the Seattle School Board authorize the Superintendent to enter into agreements and incur costs as detailed in Section Five (Fiscal Impact/Revenue Source), to implement the CHEM B instructional materials for all Seattle Public Schools' high school Chemistry B (CHEM B) science classrooms for an amount not to exceed $367,845, covering school years 2020-21 through 2027-28.

4. BACKGROUND INFORMATION

A. Background

1. Previous Adopted High School Science Instructional Materials

The history of Seattle Public Schools (SPS) high school science reveals both that there have been many efforts to update guidance for educators in this area and that these efforts have been inadequate and uneven, particularly when it comes to instructional materials.

Specifically, while the SPS Science team has provided support, training, and learning opportunities to help high school science educators improve their teaching, this has only recently resulted in a clear option for instructional materials for high school chemistry.

The most recent high school science instructional materials adoption for high school physical science in Seattle Public Schools was in 2001. This course provided the foundation for year-long Physics and Chemistry. The Active Physics and Active Chemistry series from the publisher It's About Time were centered around student inquiry, and the associated pedagogy was a significant shift for teachers. While a university physics science coach provided professional development until 2007, it was apparent that physical science teachers, typically in their first years of teaching, needed more support to properly implement the curriculum. From 2007 to 2009, SPS used a 3-year grant to develop teacher competencies in three areas: content knowledge, pedagogical knowledge, and skills in formative assessment. This supported teachers in all science disciplines but did not provide updated curricula for Physical Science or Chemistry teachers.

In the fall of 2010, the Board approved the convening of an Instructional Materials Adoption team to make a recommendation for the adoption of Physical Science, Chemistry, and Physics Instructional Materials. In the spring of 2011, the Science Instructional Materials Adoption Committee made a recommendation of the following instructional materials to the Board: Lab Aids for Physical Science, Living by Chemistry for Chemistry, and Arizona State developed Modeling Physics. The Board did not approve the science adoption due to a lack of funding. Therefore, no materials were purchased for either Physical Science or for Chemistry.

Without funding for a full adoption, Seattle Public Schools could only aid in the development of teacher skills to "make it work" with the outdated materials. For Chemistry, this meant teachers modifying any teacher-created curricula and/or lessons associated with the Chemistry textbook by Addison-Wesley, published in 1995. Addison-Wesley is comprehensive in content addressing fundamental concepts such as atomic structure and chemical reactions, but lacked more complex concepts such as organic chemistry, nuclear chemistry and acids and bases. The text provided confirmation labs and practice with math but set the teacher up to be the "keeper of knowledge," providing few opportunities for sense-making by students.

Teachers have realized, and attempted to mitigate, the inadequacy of the current instructional materials in physical science and chemistry to align with the new standards and have tried to fill the void with a variety of disjointed materials, including free internet resources, textbooks, and teacher-created units. Schools with high lab donations, lower teacher turnover, and low free-and-reduced lunch numbers, have used funds to purchase supplemental materials for their schools. This resulted in schools with highly varied instructional resources in both quality and quantity and a lack of common scope and sequence in curriculum and assessment across the district. This patchwork of disjointed and supplemental science curricula across our district's high schools is not replicable, sustainable, or equitable at a systems level, and has left many of our high school students with an inadequate understanding of chemistry.

Current, relevant, and important science topics such as global climate change, gene regulation, nuclear chemistry, and engineering are entirely absent from the current adopted curriculum. Other important topics such as the particulate nature of matter, earth science, waves and energy, nuclear chemistry, and stoichiometry are only lightly touched upon. The lesson activities are primarily "cookbook" labs, in which students follow an experimental procedure with no embedded opportunities for sense-making, engaging in scientific argument, or explaining phenomena, which has resulted in decades of science instruction characterized by "hands-on" but not "minds-on."

2. 2013 WA State K-12 Science Learning Standards, 2013-Present

In 2013, the Washington State legislature officially adopted the national science standards called the Next Generation Science Standards (NGSS) as the Washington State K-12 Science Learning Standards (WSSLS). The new science and engineering standards call for a significant shift in instruction that will engage more students in science and offers more equitable entry points for the learning of chemistry. The shift in science pedagogy called for in the new standards provides all students with 21st century skills not previously embedded within science coursework.

The 2013 Washington State Science Learning Standards are organized into three dimensions: science content, science and engineering practices, and cross-cutting concepts. The pedagogy called for in the new standards focuses on students "figuring out" instead of simply "learning about," by engaging students in gathering evidence to explain scientific phenomena, discourse and argumentation, data analysis, mathematical reasoning, supporting claims from evidence, and integrating technology into science education and engineering design. The new standards also include an entire strand focused on engineering design, both in practice and in the context of science content. The shift in pedagogy within the 2013 adopted standards demands a shift in practice to provide equitable access to science especially chemistry. Prior to these standards, chemistry was considered a course for only advanced students, leaving many students of color who did not meet the math prerequisites behind. The new materials embed the math content required rather than simply listing an unattainable prerequisite, thus offering access to all student.

3. 2013 Washington Comprehensive Assessment of Science (WCAS)

From 2010 to 2017, Washington State's high stakes science assessment was the Biology End-of-Course exam for all students and was required for graduation.

In spring of 2018, the new Washington Comprehensive Assessment of Science (WCAS) was implemented statewide for the first time at grades 5, 8, and 11. This is the first state assessment to assess student proficiency around the 2013 Washington State Science Learning Standards. The new test is an entirely digital assessment requiring students to engage interactively with technology to manipulate elements on the screen to demonstrate understanding of scientific principles and practices. Each assessment item explicitly integrates at two or three of the dimensions that comprise the science standards (Disciplinary Core Ideas, Cross-Cutting Concepts, and Science and Engineering Practices). The test will be administered annually to all grade 5, 8, and 11 students across the state and will be a graduation requirement beginning in 2020.

4. High School Science Standards Alignment Team & Professional Development
From 2007-2010, SPS received a Math Science Partnership grant from the Office of the Superintendent of Public Instruction (OSPI) to build teacher content area in biology, physics and chemistry. The professional development offered skills in three areas: Content knowledge, pedagogical content knowledge, and skills in formative assessment. As teachers developed these skills, they realized the current adopted materials did not have a clear model that took into account initial ideas or one that addressed the systems approach from the new standards. Teachers worked with universities, such as University of Washington and Everett Community College, to use materials developed for undergraduate students in biology, collaborated with other districts, and attended local and national conferences. Without the outside grant, SPS high school science teachers would not have had the money to participate in learning best practices based on brain research, nor would they have received learning on formative assessment practices. Unfortunately, deep learning in pedagogy and assessment was not enough. Teachers needed instructional materials to allow them to enact these skills. This collective work made the teachers even more aware of the deficiency of the adopted material.

In 2015, the district articulated that standards alignment and common curricular scope and sequence for all students in all schools was one of the highest priorities for the Curriculum, Assessment, and Instruction department. In response to this important initiative, the Science department convened a High School Science Alignment Team to develop a department strategic plan to align with the state's adopted 2013 science standards. The team was comprised of a diverse membership, representing all of the district's comprehensive high schools as well as representatives from some of the district's alternative high schools. Each committee member dedicated over 100 hours of their time to evaluating the standards and determining how to attend to the 72 high school standards over the three required years of science for graduation. (Note: Washington State now requires three years of science for all students as a minimum graduation requirement.) The committee members met extensively with their building colleagues to seek input and determine the final scope and sequence for science. The resulting sequence includes Physics A and Chemistry A for 9th graders, Biology A and Biology B for 10th graders, and a variety of options for students in grade 11. One of the 11th grade options is Physics B and Chemistry B, to meet the needs of students who had previously not been included in either physics or chemistry courses because of the math prerequisites.

Concurrent to the work of the alignment committee, high school teachers were invited to attend district-wide professional development sessions offered by the district science department in collaboration with higher education partners from Seattle Pacific University, Michigan State University and the University of Washington. This professional learning was to help them develop understanding of the pedagogical shifts called for by our new science standards and to begin transitioning their instruction and assessment practices to align with these standards. An important outcome of this professional development was the need for instructional materials that align with the complex and innovative new science standards.

5. High School Adoption Process and Committee Work, November 2018-Present
The School Board instructed the Science team of Curriculum, Assessment, and Instruction to launch a high school science instructional materials adoption in April 2018. The first phase of the adoption process was carried out over a 11-month period and proceeded according to guidelines outlined in School Board Policy 2015. The process occurred in three stages: Stage 1, Field Test, and Stage 2. Phase 2 included a follow-up process for CHEM B in 2019-2020 (see Attachment E).

5a. Stage 1: October 2018-December 2018

A High School Science Instructional Materials Adoption Committee comprised of teachers, school leaders, parents, professionals in STEM fields, and other community members was selected through an application process to ensure a committee that represented the diversity of stakeholders in SPS, including geography, race, ethnicity, gender, and age (see Attachment C).

The committee members identified five categories and 71 specific criteria for evaluation, based on the needs, priorities, data, and research that emerged from the following sources:

- 2013 Washington State Science Learning Standards (adopted from the 2013 Next Generation Science Standards)
- Preliminary Family/Community and Teacher/Staff needs assessment and input survey, which identified the priorities around science materials, instruction, and learning in our district
- A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (National Research Council [NRC] of the National Academy of Sciences)
- The Educators Evaluating the Quality of Instructional Products Rubric (EQuIP) for Science
- Anti-Bias Criteria Screening Tool outlined in Board Policy 2015
- WA OSPI Equity & Civil Rights Task Force
- SPS Formula for Success

The categories were weighted, and a draft of the Science Adoption Review Criteria was presented to the SPS Instructional Materials Committee (IMC) for feedback and the final draft approved for use as the committee's evaluation tool of candidate programs (see Attachment D). The weighted review criteria categories, as voted by the committee included:

- Category 1: Standards Alignment (24%)
- Category 2: Assessments (20%)
- Category 3: Inclusive Educational Practices (17%)
- Category 4: Evaluation of Bias Content (16%)
- Category 5: Instructional Planning and Support (23%)

Nine curriculum vendors responded to the district's Procurement Department's Request for Proposal (RFP). Two programs developed by district science teachers, in collaboration with university partners, were also presented to the Committee. Of the candidates, six offered materials for consideration for BIO A, six for BIO B, eight for

CHEM A and CHEM B, and six for PHYS A and B. Between October and December 2018, committee members worked collaboratively in small review teams, composed of both teachers and community members, to examine each of the instructional programs using the Review Criteria. The review teams assigned each criteria and category a quantitative score along with annotations based on evidence collected directly from the program materials.

Each of the instructional program candidates were reviewed a minimum of two times. Due to the breadth and depth of the criteria contained within the five categories of the Review Criteria, a protocol was proposed in which a vendor program could be eliminated from consideration if two separate review teams, independent from each other and without knowledge of each other's work, reached consensus that the candidate materials did not meet the minimum alignment for science standards alignment or anti-bias content and should not be a candidate for consideration.

Based on this reexamination, the committee voted unanimously to advance to the Field Test Round of the High School Science Adoption process as its finalists for Chemistry B the following program:

- Accelerate Learning, Inc – *STEMScopes*

A recommendation for the District-Developed Curriculum for CHEM B, incomplete at the time, was discussed by the committee after reviewing the similar curriculum for CHEM A.

5b. Field Test, January – March 2019

All SPS high school science teachers were invited to apply to participate in the High School Science Adoption field test pending principal approval and demonstration of understanding of the 2013 Washington State Science Learning Standards. Twenty-one teachers and their students, representing a diversity of years in the profession, science background, gender, and ethnicity, were selected by the Adoption Coordinator to teach the field test unit in their classrooms. The field test classrooms included over 2200 students from nine high schools and three Highly Capable middle schools located in multiple regions of the district, and represented Seattle Public Schools' diverse racial, ethnic, and socioeconomic groups and student populations, including English Language Learners, Special Education, Highly Capable, and general education.

The field test teachers were instructed to implement and instruct a pre-selected unit based on each course. Field test teachers received 3 hours of training from the vendor including follow-up time to plan and calendar their unit with their field test colleagues.

Field test teachers were given the following guidelines and expectations for field test participation in order to ensure the validity of the field test and provide multiple data collection opportunities about each candidate program:

- Implement the unit with as much fidelity as possible

- Submit feedback via a digital survey platform on a weekly basis about the effectiveness of learning activities, standards alignment, and student engagement.
- Work with the Adoption Coordinator and Science Department Specialists to schedule a lesson observation and participate in a post-observation interview
- Select a small student focus group to be interviewed about their experience with the field test unit
- Have all students participating in the field test complete an end-of-unit student survey around the following attributes:
  - Engagement in standards-aligned science practices
  - Using instructional materials that are organized around a conceptual storyline and anchored by a puzzling science phenomena problem to solve
  - Sharing science ideas through student discourse
  - Relevance and accuracy of content for science learning
  - Equity, Identity, and Disposition
- Administer and score the provided pre-unit and post-unit assessments and record student scores to quantify student growth
- Participate in a panel interview session with the Adoption Committee

5c. Stage 2: Analysis, March 2019

Prior to beginning the final review and analysis of all data collected for each candidate program, Adoption Committee members completed a survey in which they provided input about how each category of data collected during Stage 1 and the Field Test Stage of the adoption process should be weighted.

The Adoption Committee reconvened on March 13 and March 16, 2019 at the conclusion of the field test period for panel interview sessions with the field test teachers from each candidate program, organized by course. Each field test reported to the committee about their experience implementing the candidate program they field tested and their perception of their students' experience, and provided input and feedback about the instructional materials in that program. In the panel interview, field test teachers were asked a set of 23 questions aligned with Science Instructional Materials Review Criteria categories and criteria by the Adoption Coordinator. Adoption Committee members asked follow-up questions of the field test panels throughout the session. Committee members were instructed to record notes during each panel interview. Following each panel interview session, committee members analyzed their notes for evidence of alignment with the five categories in the Review Criteria and assigned a value between 0 and 4.

After each panel, the Adoption Committee worked in small teams to review additional data sources generated from the Field Test stage for evidence of alignment with the Science Instructional Materials Review Criteria, including post-observation teacher interviews, student focus group interviews, end-of-unit student attribute surveys, and student growth data as measured by pre- and post-unit assessments. Combining this new data with their notes from the Field Test teacher panels, the Committee members collaborated in their teams to collectively synthesize and review all the data for each program to reach consensus on a Field Test score between 0 and 4 in each of the five categories detailed in the Science Instructional Materials Review

Criteria (see Attachment D). The score for each category was weighted as previously determined on the Review Criteria, then tallied and reported as a consensus score. Committee members then reviewed Community Input Forms submitted by members of school communities and the public who reviewed instructional materials from the vendor program under consideration for adoption. Although the amount of data generated for each vendor program was very small, committee review teams analyzed the input forms for each finalist vendor program and assigned a Public Input score between 0 and 4 in each of the five categories in the Science Instructional Materials Review Criteria (see Attachment D). The score for each category was weighted and then tallied and reported as a consensus score.

6. Data Collection Results

In addition to the results of the Adoption Committee's evaluation of the finalist candidate programs in Stage 1 using the Science Instructional Materials Review Criteria, the committee also reviewed multiple data sources to inform their selection and recommendation of the most suitable candidate for adoption. These data were collected from the classroom field test of the candidate programs, which included teacher and student feedback, and input collected during the public display of the instructional materials.

6a. Summary of Committee Scoring at end of Stage 1

At the end of Stage 1, the Adoption Committee members completed their evaluation and scoring review of the program instructional materials using the Science Instructional Materials Review Criteria described above in Section A. At the conclusion of Stage 1, the total average weighted scores as measured by the Science Instructional Materials Review Criteria for each of the categories were as follows:

- Chemistry:
    - Accelerate Learning, Inc.: *STEMScopes* – 37.4
    - District-Developed Curriculum for CHEM A – 35.1
    - McGraw-Hill Education: *Inspire Science* – 32.6
    - Houghton Mifflin Harcourt: *HMH Science Dimensions* – 27.3
    - Pearson Education, Inc.: *Pearson Chemistry* – 11.8
    - PASCO Scientific: *Essential Chemistry* – 7.2

The composite score was based on a rubric designed to result in a 75-point score for an instructional program that exhibited strong evidence for alignment to the standards in every criterion.

6b. Field Test Data Summary

The field test portion of the adoption provided an opportunity to see the candidate programs enacted in the classroom and to collect data around alignment to the science standards, assessment systems, inclusive educational practices, instructional planning and support, and student and teacher attitudes and dispositions, as well as collect student growth data.

6b. i.) Field Test Teacher Panel Interview Data: On March 13 and March 16, 2019, all teachers participating in the field test attended a panel interview session conducted by the Adoption Committee members and responded to a set of

questions about their experience with, and attitudes around, the candidate program they field tested in their classroom. The questions addressed the following topics: Standards Alignment, Assessments, Inclusive Educational Practices, Evaluation of Bias Content, and Teacher Supports for Planning and Usability.
Committee members convened following the field test teacher panel interview session to review and analyze their panel interview reports for qualitative evidence of the field-tested materials' alignment with the Instructional Materials Review Criteria categories: Standards Alignment, Assessments, Inclusive Educational Practices, Evaluation of Bias Content, Instructional Planning and Support.

Based on this analysis, committee members reached a consensus that there was "strong evidence" from the CHEM A District-Developed Curriculum field test panel reports for alignment in each of the Review Criteria categories. However, there was only "minimal" evidence from the STEMScopes field test panel reports for alignment in each of the Review Criteria categories.

6b. ii.) Field Test Classroom Observation Data and Teacher Interviews: Observations were conducted in each field test classroom and post-observation interviews of the field test teacher were conducted. A qualitative analysis of the data was performed to identify evidence of 10 characteristics: evidence of science practices within the unit, presence of authentic phenomena in the unit storyline, revisiting the phenomena during the unit, evidence of engaging phenomena within the unit, multiple types of evidence gathered during the unit, student engagement around the evidence gathered, opportunities of students to engage in sense-making discourse, self-assessment, quality of student explanations, and usefulness of the materials.

6b. iii.) Student Focus Group Interview Data: A student focus group from each field test classroom was selected by the field test teacher to be interviewed by the Adoption Coordinator or Science Department specialists who conducted the classroom observation responses.
Student data was collected from the student focus group interviews that followed the field test classroom observations. A qualitative analysis of the data was performed to identify evidence of 9 characteristics that closely aligned with the interview questions: discourse for sense-making, consensus building, phenomenon present and helpful, elicitation of initial models, evidence collected helped understand the phenomenon, tools to track ideas through the unit, assessments that were fair and helped know if you were learning, the unit helped you learn science, and whether the students would recommend these materials.

6b. iv.) Student Growth Data: All teachers participating in the field test were asked to administer the vendor-provided pre-unit assessment at the beginning of the field test and the vendor-provided end-of unit assessment at the conclusion of the field test in order to collect student growth data for the standards addressed in the field test unit as a result of instruction. The average student growth data for each field test teacher was calculated.

The average student growth scores for each vendor for the 6 courses considered were as follows: [Note: All courses are provided to offer a comparative analysis.]

- Carbon TIME (BIO A): 50.2%
- District-Developed Curriculum (BIO B): 64.5%
- District-Developed Curriculum (CHEM A): 68.6%
- STEMScopes (CHEM A): 28.1%
- STEMScopes (CHEM B): 0.9%
- PEER (PHYS A): 53.2%.

6b. v.) Student End-of-Unit Attribute Survey All students who participated in the field test were asked to complete an end-of unit attribute survey that asked them to reflect on their learning and engagement during the field test unit. The survey questions asked students to self-report about their learning over the course of the field test instruction and their attitudes about their experience with the unit and included questions about:

- Students' engagement in standards-aligned science practices
- Using instructional materials that are organized around a conceptual storyline and anchored by a puzzling science phenomena problem to solve
- Sharing science ideas through student discourse
- Relevance in science learning
- Equity, Identity, and Disposition

1,247 students completed the survey and the responses were tallied and reported.

6b. vi.) Field Test Data Synthesis and Analysis Committee members collaborated in their teams to collectively review and synthesize all Field Test data collected for each program. The review teams worked to reach consensus on an overall score for each program in each of the five categories detailed in the Science Instructional Materials Review Criteria (see Attachment D) using the 0-4 scoring rubric. Once the scores were assigned and weighted using the Review Criteria weightings, they were tallied and reported as a consensus Field Test score for each candidate program. The consensus Field Test scores reported by the committee are as follows for the 6 courses in consideration:

- Carbon TIME (BIO A): 74.2
- District-Developed Curriculum (BIO B): 79.8
- District-Developed Curriculum (CHEM A): 77.5
- STEMScopes (CHEM A): 22.8
- STEMScopes (CHEM B): 22.5
- PEER (PHYS A and B): 76.1

6c. Community Input from Instructional Materials Public Displays and Information Sessions

Community and family stakeholders were invited and encouraged via multiple communications and community engagement methods to review the adoption candidate programs and submit a Community Input Form.

Textual versions of the candidate program were publicly displayed for nine weeks and links to the candidate programs' online materials were available for public review via the district website. In addition, two "open house" public information sessions were held in the north and south end of the district, respectively, and were open from 9:00am-3:00pm. The Adoption Coordinator, Science Department Staff, members of the Adoption Committee, and Science Adoption Field Test teachers were available to answer questions about the candidate programs and to provide guidance in reviewing the materials. Over 25 community members attended these "open house" public information sessions.

Community Input Forms were available electronically on the District website, at the four public display locations, and the open house events for community members to review the three candidate programs and provide feedback. The Community Input Form included criteria selected from the five categories in the Science Adoption Review Criteria used by the Adoption Committee to review and assess all the candidate materials, including Standards Alignment, Assessments, Inclusive Educational Practices, Evaluation of Bias Content, and Instructional Planning and Support. Translated versions of the Community Input Form were made available in the District's top five languages: Spanish, Chinese, Somali, Tagalog, and Vietnamese.

7. Synthesis of All Data Collection Results

Each committee review team applied the weighting formula developed by the committee at the outset of Stage 2 to the scores below for each of the three candidate programs:

- Review Criteria Average Score (Stage 1)
- Field Test Data Review Team Consensus Score
- Public Input Data Review Team Consensus Score

Each committee review team calculated their weighted consensus scores for the Review Criteria scores from Stage 1, the Field Test data, and the Public Input data including annotated evidence collected from the data to support their scores. Each review team reported their scores and supporting evidence as to the other committee review teams. The committee identified patterns and trends across all review team reports and each review team tallied their three final scores to report a total score for this candidate.

Based on the committee's findings from the field test outcomes and data collected, the District-Developed curriculum for CHEM A was the top candidate based on the field test data and the committee Review Criteria data regarding the program's strong storyline and phenomena, opportunities for student discourse, and engagement in practices and rigor. The STEMScopes program did not receive positive feedback around usability and differentiation, field test data, including teacher input, revealed that it did not have an overarching phenomenon, therefore no storyline, and little student growth of scientific content understanding.

Adoption Committee members commented that they had strong concerns about the lack of student growth and the student comments from STEMScopes. One group said that the student growth data was both "compelling and heartbreaking." One quoted a teacher from the field test panel, who said that the STEMScopes curriculum "made me a worse teacher."

Additionally, Adoption Committee members identified strong concerns around bias content within STEMScopes. They noted that some teachers were offended by content found within at least one video in the Field Test unit. Many members agreed that this was not only concerning, but a “red flag” that eliminated STEMScopes from their considerations.

Conversely, the district-developed curriculum for CHEM A received much higher praise. Teams mostly agreed that the curriculum strongly addressed the standards, though some teams felt that it could take a less conservative approach. Some members felt that there was a missed opportunity in addressing cultural aspects within the curriculum, but that the collaborative nature of the curriculum made addressing such concerns easy. Adoption Committee members identified comments from students that they said demonstrated a passion for the content, that students appreciated it and learned from it better than from STEMScopes. Students stated that they looked forward to coming to class and learning chemistry from the district-developed curriculum.

The Adoption Committee then proceeded to the decision-making phase. Adoption Committee members agreed to an anonymous vote to confirm their recommendations for adoption to the School Board. The results confirmed support of Carbon TIME as the sole recommendation for BIO A, the District-Developed Curriculum as the sole recommendation for BIO B, the District-Developed Curriculum as the sole recommendation for CHEM A, and PEER as the sole recommendation for PHYS A and B.

The Committee elected to not move a curriculum forward for Adoption for CHEM B, but recommended that funding be made available for teachers to continue to collaboratively develop CHEM B, using the CHEM A District-Developed course as a guide.

After examining all of the procedures and steps in the adoption process and ensuring that all steps in Board Policy 2015 were met, the Instructional Materials Committee approved the recommendations as listed above for adoption on March 28, 2020.

8. Decision

Each Adoption Committee review team calculated their weighted consensus scores for the Review Criteria scores from Stage 1, the Field Test data, and the Public Input data including annotated evidence collected from the data to support their scores. Each review team reported their scores and supporting evidence as to the other committee review teams. The committee identified patterns and trends across all review team reports and each review team tallied their three final scores to report a total score for each candidate finalist program. The Adoption Committee then proceeded to the decision-making phase. Adoption Committee members agreed to an anonymous vote to identify a single finalist for recommendation for adoption to the school board for each of the courses.

Based on the synthesis and summary of all data reviewed by the committee and the reporting of final scores, the District-Developed Curriculum was overwhelmingly recommended for Adoption for CHEM A, with six members recusing themselves from the vote. One member voted to move neither program forward for Adoption, while 58.3% of voting members recommended that the Board not only Adopt the District-Developed

Curriculum, but also provide funding for additional improvements through teacher collaborations. in professional development settings.

In addition to the above, the Adoption Committee voted unanimously to not recommend an Adoption for CHEM B; however, they also unanimously voted to put forth a recommendation similar to the above, to recommend that the Board provide funding for continued development of the District-Developed Curriculum for CHEM B through teacher collaborations in professional development settings.

After examining all the procedures and steps in the adoption process and ensuring that all steps in Board Policy 2015 were met, the Instructional Materials Committee approved the sole recommendation of Carbon TIME for adoption for BIO A, the District-Developed Curriculum for adoption for BIO B, the District-Developed Curriculum for adoption for CHEM A, and PEER for adoption for PHYS A and B on March 16, 2020.

9. Phase 2: 2019-2020 Reconvening of the Adoption Committee for CHEM B
After the 2019 BAR was approved by the Board, the work on the CHEM B District-Developed curriculum continued as planned. Chemistry teachers met over the summer for two weeks to continue the development of Chemistry B instructional materials. The work continued into the 2019-2020 academic year, with two release days for the teachers to continue the work and an allocation of 0.1 FTE Science Specialist to work toward completion of the online resources.

An addendum to the adoption communications plan (see Attachment A) was submitted and approved by the Instructional Materials Committee. In the meantime, the materials were put on public display on the SPS website for a period of four weeks, SPS Communications issued a press release, and participating teachers sent information home to families to inform them of the public display. Two Community Open Houses were held at the beginning of March 2020, to allow families to discuss the materials with the teachers that helped to develop the curriculum. The curriculum was field tested in two high school classrooms (see Attachment G). SPS Curriculum Specialists visited those classrooms to observe lessons and to interview students, as per the procedures developed during the 2019 adoption cycle (see Attachment H.4). Students were also asked to complete a survey sharing their impressions of science (see Attachment H.2).

The Adoption Committee reconvened on March 14, 2020, to review the completed District-Developed curriculum for CHEM B as well as the results of the field test and the collected community feedback (see Attachment F). The committee used the same protocols as were developed for the 2019 adoption cycle and worked in teams to review the curriculum using the comprehensive Review Criteria Tool (Attachment D). A panel of the field test teachers was convened, at which the teachers reported to the committee about their experience implementing the curriculum and their perception of their students' experience as well as to provide input and feedback about the instructional materials from a teacher point of view. During the panel, teachers were asked the same set of 23 questions used during the 2019 adoption process. Following the teacher panel, the teams reviewed field test data collected and quantified their analysis of this data (see Attachment H).

Prior to beginning the final review and analysis of all data collected, the Adoption Committee members completed a survey in which they provided input about how each category of data should be weighted (see Attachment I). When the input was averaged, the weights were assigned to each data set as follows:

- Science Review Criteria Scores – 44.0%
- Field Test Data – 48.0%
- Public Display and Open House Community Input Forms – 8.0%

Applying their quantitative scoring to the determined weighting, each of the teams presented their results in the form of a summary score (see Attachment I). The average summary score for the District-Developed curriculum was 64.6. In contrast, the average summary score for the STEMScopes CHEM A curriculum, not recommended for adoption, was 25.7.

The Science Instructional Materials Committee (IMC) deliberated and at a meeting on March 16, 2020, voted unanimously to recommend to the IMC that the District-Developed instructional materials be moved forward for adoption for use in all district high school CHEM B classrooms. The IMC convened, reviewed the Science Instructional Materials Review Committee process and voted unanimously to move Chem B forward to the Superintendent as per Policy 2015.

B. Research

SPS Research and Evaluation Department Curriculum Adoption Teacher Survey, February 2019 (Attachment L)

A critical part of the district's process for adopting and implementing new curriculum materials is learning how to best support teachers, for example by providing professional development, support, and resources where they are most needed. Accordingly, the SPS Research & Evaluation (R&E), in partnership with the Curriculum, Assessment and Instruction (CAI) department administered a survey in February 2019 to certificated classroom teachers regarding their experiences with new or planned curriculum materials. The survey included question panels related to the K-12 science instructional materials adoption.

In February 2019, the SPS Research and Evaluation Department administered the Curriculum Adoption Teacher Survey for all elementary school teachers, K-12 science, as well as middle school math and K-5 ELA teachers (see Attachment L). 57% of science teachers at grades 9-12 responded to the survey. The survey provided important data for the Adoption Committee and SPS Science Department about the need for high quality instructional science materials to support alignment to standards and close the opportunity gap in science learning for students of color in the district. The survey also asked teachers to identify the types of systems, structures, and supports needed to transition to a new instructional materials program following adoption. Teachers hope that new NGSS-aligned materials will help to engage students in authentic, hands-on learning experiences that center around a scientific phenomenon that students can relate to their own lives. This, they said, will help students who might typically not have enjoyed science become enthusiastic science learners. Teachers also asserted that interest and skills in science are necessary to succeed in the highly scientific and STEM-based economy into which they will graduate.

C. Alternatives

1. Do not approve the committee-recommended instructional materials and return to each teacher developing their own instructional resources. This alternative is not recommended by the High School Science Instructional Materials Adoption Committee of experts that spent 60 hours to review these materials, adhering to a strict process and review of the candidates. Independent, autonomous teaching that creates different programs in each school and each science classroom within a school is not an effective way to provide equitable science education to our students across the district. Teachers will be forced to continue to work in isolation within their buildings and attempt to align their personal lessons to the standards. Our students who have not formerly been included in Chemistry will not have these equitable resources needed to ensure their success. In addition, continuing with the status quo:

- Not aligned to the 2013 WA State Science and Engineering Standards (currently aligned only to the 2009 standards), which does not prepare students for advanced science courses, for the WA State high stakes assessment in grade 11, or for college
- Teachers do not have the expertise, nor the time, to develop curriculum in a vacuum
- Without collaboration with colleagues, there are no checks and balances to ensure the curriculum addresses the standards and is rigorous
- No embedded formative or summative assessments, no embedded discourse for sense-making, no differentiated or multilingual reading materials, and no opportunities to use technological tools to deepen the science experience
- Assessments will not be consistent and likely not 3-dimensional. It is impossible to develop a robust assessment bank in a vacuum
- No guarantee of engineering design instruction
- Current science resources are not based on the latest brain-based research about how students learn, do not contain best practices used in literacy and mathematics, nor address cultural relevancy

5. FISCAL IMPACT/REVENUE SOURCE

The cost to adopt the district-developed materials for Chemistry B is $367,845. Year 1 of the costs shown below is fiscal year 2019-2020. Implementation of the curriculum will cover school years 2020-21 through 2027-28.

	Year 1	Year 2	Year 3	Year 4	Years 5-9	Total Years 1-9
ADA and Copyright	$ -	$ 50,000	$ -	$ -	$ -	**$ 50,000**
Professional Development	$ 34,147	$ 35,171	$ 36,226	$ -	$ -	**$ 105,544**
.5 FTE Curriculum Specialist	$ -	$ 51,411	$ 78,483	$ 82,407	$ -	**$ 212,301**
TOTAL	**$ 34,147**	**$ 136,582**	**$ 114,709**	**$ 82,407**	**$ -**	**$ 367,845**

The District-Developed Curriculum for CHEM B is a free and open resource. The total costs include ADA and copyright compliance as well as professional development and a curriculum specialist to shepherd the implementation. Professional development costs are based on collective bargaining agreement hourly and substitute pay rate.

There is currently confirmed budget for High School Science. The revenue source is the curriculum budget in the general fund.

Expenditure:	☐ One-time	☐ Annual	☒ Multi-Year	☐ N/A
Revenue:	☐ One-time	☐ Annual	☐ Multi-Year	☒ N/A

6. COMMUNITY ENGAGEMENT

With guidance from the District's Community Engagement tool, this action was determined to merit the following tier of community engagement (See Attachment B):

☐ Not applicable

☐ Tier 1: Inform

☐ Tier 2: Consult/Involve

☒ Tier 3: Collaborate

Throughout the duration of the Adoption Process, community, family, and teacher stakeholders received regular communications and updates, and were informed of all opportunities to provide input or participate in the process, including:

- Applying to serve on the Adoption Committee
- Submitting input via a paper or online survey as part of the Needs Assessment conducted at the outset of the process to inform the development of the Review criteria used to evaluate the vendor programs submitted for consideration
- Reviewing the instructional materials for the three finalists' candidates online or in person at one of the five public display locations across the district and submitting a Community Input Form with their feedback
- Attending an open house Science Adoption information and instructional materials review session
- Following the outcomes of all Adoption Committee meetings on the SPS Science Adoption webpages through publication of meeting notes
- Receiving updates and announcements via SPS Communications on the SPS website and via emails to SPS families and staff
- Communications were translated into five languages to encourage participation.

This input and participation was solicited by the Science Department through multiple communication pathways including multiple emails via SPS Communications, announcements on the District website and SPS social media, through a robust website presence providing links to online versions of the finalists candidate materials, and communications to SPS high school principals and high school teachers. The Science Department also provided community

engagement touch-points to reach stakeholders, including hosting two open house information sessions in the north and south end of the district.

Online instructional materials for the District-Developed curriculum were made available for public review and input online on the SPS Science Adoption webpage, as well as at the following physical locations across the district:

- Nathan Hale High School
- Chief Sealth International High School

7. EQUITY ANALYSIS

"There is no doubt that science and science education are central to the lives of all Americans. Never before has our world been so complex and science knowledge so critical to making sense of it all. When comprehending current events, choosing and using technology, or making informed decisions about one's health care, understanding science is key. Science is also at the heart of the ability of the United States to continue to innovate, lead, and create the jobs of the future. ALL students no matter what their future education and career path must have a solid K–12 science education in order to be prepared for college, careers, and citizenship." (*Appendix A: Conceptual Shifts in the Next Generation Science Standards.* National Research Council. 2013. *Next Generation Science Standards: For States, By States*)

Seattle Public Schools is committed to eliminating opportunity gaps to ensure access and provide excellence in education for every student. *Board Policy #0030 - Ensuring Racial and Educational Equity* was developed to work toward the district's mission to eliminate opportunity gaps. Goals of this policy that will be supported through the adoption of a standards-aligned K-12 science instructional materials program include equitable access to a high-quality curriculum and educational resources, and professional development to strengthen teachers' knowledge and skills for eliminating opportunity gaps and other disparities in achievement. The last high school science adoption in Seattle Public Schools was in 2001-2002. In the absence of an updated, standards-aligned science curricula, schools with heavy PTSA involvement, lower teacher turnover, and low free-and-reduced lunch, have used building funds to purchase supplemental materials for their schools. This has resulted in highly varied instructional resources in both quality and quantity across our district and a lack of common scope and sequence in curriculum and assessment. This patchwork of disjointed and supplemental science curricula is not replicable or sustainable at a systems level and, most importantly, is profoundly inequitable for Seattle Public School's underserved populations. As a result of this inequitable access to science instructional materials, low-income students and students of color are far more likely to be inadequately prepared for college-level science courses, as evidenced by the achievement gaps in SPS between white students and students of color reported for grade 11.

Nationally, there is a crisis in equity in STEM fields, and in Washington state there is great disparity between the concentration of STEM-related jobs and a prepared labor pool. By 2030 in Washington State, 67% of job openings will require a STEM credential or training. Currently, 37% of students in the class of 2021 are expected to lack adequate training, preparation, or credentials for entry into STEM careers or post-secondary opportunities (Washington STEM, *STEM by the Numbers: Equity and Opportunity,* 2019. http://www.washingtonstem.org/STEMbythenumbers). The data below quantifies the

manifestation of the opportunity gap for students of color locally and nationally at both K-12 and in the workforce:

- Washington State's 4th grade Black and Latino students, respectively, score 31 and 29 points lower on the National Assessment of Educational Progress in Science. (*2015 National Assessment of Educational Progress (NEAP) Nation's Report Card*, http://nces.ed.gov/nationsreportcard/states/)
- In the first year of the 5th grade WCAS, Washington State's new statewide science assessment, SPS White students in grade 5 had a passing rate of 81.2%, while their Black counterparts had a passing rate of 28.6% and Latino counterparts a passing rate of 44.6% (WA State Report Card, 2017-18).
- Washington's achievement gaps in math and science have not improved in over a decade and are the 12th largest in the nation. If efforts to improve the achievement gap continue at this current rate, it would take 150 years for Black students to realize the same level of achievement as their peers (Center for Education Policy, *The Achievement Gap: Slow and Uneven Progress for Students,* 2010).

Inequitable access to science instruction and materials has been particularly impactful to our underserved populations of students, including English language learners and students with special needs. Historically, K-12 science has focused on direct instruction and an overemphasis on confirmation labs (activities for which the outcome is known and used as an exercise to confirm an idea), devoid of opportunities to engage in authentic science practices or engineering design activities, pedagogically making it difficult for many learners to access and engage meaningfully with the science content. The adoption of new science materials will address the need to provide science learning that will include multiple modalities in both instruction and assessment.

The adopted materials will increase equitable access to all K-12 students and prepare them for success in core science courses in high school and college preparatory science courses (AP/IB), which is particularly important as Washington State moves to a 24-credit graduation requirement, necessitating completion of three years of science coursework. In addition, the class of 2020 will be the first for whom passing the new statewide science assessment, the WCAS, will be a graduation requirement. The test, taken at the end of grade 11, addresses all of the 9-12 science standards, whereas the previous state science assessment, the Biology EOC, tested only Biology standards.

Research suggests that a diverse STEM workforce is essential not only to providing equitable opportunities, but to ensuring that the outcomes of STEM endeavors in research and industry reflect, and are enriched by, the diverse perspectives and attributes represented by our regional and national populace. In an article published in Scientific American by Medin, Lee, and Bang (October 2014), the authors argue that "STEM-related endeavors are better when they include culturally diverse perspectives and approaches… Being around people who are different from us makes us more creative, more diligent, and harder-working. It promotes innovation."

In order to help ameliorate the gender, racial, cultural, religious, and/or sexual orientation bias frequently experienced by students, all programs submitted for review were thoroughly and carefully reviewed for evidence of an anti-bias lens using the Evaluation of Bias Content category of the Review Criteria which includes the criteria from the Board Policy 2015 Anti-Bias Screener tool and the Washington Models for the Evaluation of Bias Content in Instructional

Materials (publ. Sept. 2009). Committee members scrutinized the texts for examples of materials containing bias and/or stereotyping based on gender, race, religion and/or sexual orientation. Committee members reviewed texts and recorded all findings, drawing from evidence from the instructional materials. Any instructional materials program that failed to achieve an acceptable score in this category were eliminated from consideration.

By increasing the access of all students to science, particularly students of color, English language learners, and students with special needs, Seattle Public Schools will continue to prepare students for STEM fields. Most STEM professions require at least baseline competencies in chemistry. Historically, black and brown students in Seattle Public Schools have not had access to chemistry due to math prerequisites. Approximately 40% of our African American males enter high school without taking Algebra, therefore making a math-required chemistry class inaccessible, as well. Because prior to the class of 2020, only two years of science was required, many students took a pass on chemistry. That can no longer be acceptable. The State Standards require chemistry as one component of the now three-year graduation requirement. This alignment requires all students to have access to chemistry by training teachers to learn skills to integrate the math learning into the curriculum and to deliver these engaging chemistry storylines that are authentic, relevant and important.

8. STUDENT BENEFIT

Based on all of the evidence gathered during the course of the 12-month adoption process, the Adoption Committee firmly believes that adopting the District-Developed Curriculum for all CHEM B high school science classrooms will provide a substantial benefit to students, as measured by student academic growth, engagement in standards-aligned practices, availability of teacher instructional scaffolds and supports, and greater equity and consistency in students' experiences across the district as a result of a common curricular scope and sequence and common assessments. A summary of these benefits is outlined below.

- **Common Instructional Materials and Unit Scope and Sequence**
  Regardless of school assignment, students in all schools across the district will have access to current, high-quality, standards-aligned science instructional materials in a common scope and sequence and will be held to common expectations for learning outcomes for the first time in the history of Seattle Public Schools. Having common science instructional materials and assessments in all CHEM B classrooms will maximize the benefit of Science Department supports and professional development opportunities. This common scope and sequence allow teachers to work collaboratively toward standards-aligned instructional practices and use of assessments to best support and meet student learning needs, including the development of resources to differentiate instruction and provide culturally responsive instruction.

  In addition, students will receive instruction from teachers that have received adequate professional development in implementation and effective use of the instructional materials. The 2019-24 Strategic plan vision is Every Seattle Public Schools' student receives a high-quality, world-class education and graduates prepared for college, career, and community. An excerpt from the Theory of Action is as follows: WHEN WE FOCUS on ensuring racial equity in our educational system, unapologetically address the

needs of students of color who are furthest from educational justice, and work to undo the legacies of racism in our educational system...

BY doing the following:

- Allocating resources strategically through a racial equity framework
- Delivering high-quality, standards-aligned instruction across all abilities and a continuum of services for learners

- **Educational Excellence and Equity for Every Student**
  Goals of Policy No. 0030 will be supported through the adoption of a standards-aligned high school science instructional materials program that includes equitable access to a high-quality curriculum and educational resources, and professional development to strengthen teachers' knowledge and skills for eliminating opportunity gaps and other disparities in achievement.

9. WHY BOARD ACTION IS NECESSARY

☒ Amount of contract initial value or contract amendment exceeds $250,000 (Policy No. 6220)

☐ Amount of grant exceeds $250,000 in a single fiscal year (Policy No. 6114)

☐ Adopting, amending, or repealing a Board policy

☐ Formally accepting the completion of a public works project and closing out the contract

☒ Legal requirement for the School Board to take action on this matter

☒ Board Policy No. 2015, Selection and Adoption of Instructional Materials, provides the Board shall approve this item

☐ Other:

10. POLICY IMPLICATION

The motion is in compliance with Policy No. 2015, Selection and Adoption of Instructional Materials. The process described in this BAR followed the requirements outlined in this policy. The motion is also in compliance with Policy No. 0030, Ensuring Educational and Racial Equity, as laid out in Section 7 - Equity Analysis. In addition, Policy No. 6220, Procurement, requires Board action because the contract exceeds $250,000.

11. BOARD COMMITTEE RECOMMENDATION

This motion was discussed at the Curriculum and Instruction Policy Committee meeting on April 21, 2020. The Committee reviewed the motion and moved it forward with a recommendation for approval.

12. TIMELINE FOR IMPLEMENTATION

Upon approval of this motion, Adoption of the District-Developed Curriculum as the official science curriculum for CHEM B, Seattle Public Schools will provide the recommended funding for professional development as well as providing funding for a thorough ADA and copyright compliance vetting to be complete for the 2020-2021 school year.

The implementation will follow this general timeline:

- May 2020: Communications to families, community, staff, and school and central leaders
- May 2020: The Science Department and the Department of Curriculum, Assessment, and Instruction will develop a schedule and goals and outcomes for initial and ongoing professional development.
- May-July 2020: Department of Technology Services will work with XanEdu Publishing, Inc. and Chemistry teachers to develop a pathway to compliance for all online components of the adopted program with applicable copyright laws.
- August 2020: CHEM B teachers will receive 3 days of in-depth professional development in the format, pedagogy, and implementation of the adopted instructional materials.
- September 2020-June 2023: Three additional days of science teacher professional development distributed throughout the school year for each of three years plus implementation of online professional development opportunities including Schoology-based resources and Microsoft Teams-based webinars.
- June 2021: The Science Department will conduct an evaluation of the first-year implementation of the adopted instructional materials, including analysis of student growth data and teacher/student/community input and feedback.

13. ATTACHMENTS:

- Attachment A: 9-12 Science Adoption Communications Plan (for reference)
- Attachment B: 9-12 Science Adoption Community Engagement Plan (for reference)
- Attachment C: High School Science Adoption Committee Membership (for reference)
- Attachment D: High School Science Adoption Instructional Materials Review Criteria (for reference)
- Attachment E: High School Science Adoption Process Timeline, Summary, and Outcomes (for reference)
- Attachment F: Summary of Community and Family Input and Feedback (for reference)
- Attachment G: Field-Test Schools and Participating Teachers w/ distribution map (for reference)
- Attachment H: Field-Test Data and Analysis: Field Test Teacher Input & Feedback, Student Growth Data, Classroom Observation Data, Student Interview and Survey Data (for reference)
- Attachment I: Analysis Summary of Feedback & Data Collected (for reference)
    - Includes all data collected from all sources (community, field test teachers, student surveys and interviews, and student assessment data, etc.)
    - How adoption committee used this to score and determine final candidates for the BAR
- Attachment J: Racial Equity Analysis Tool (for reference)
- Attachment K: ADA/Consent Decree Compliance Ratings (Pending) (for reference)

- Attachment L: SPS Research & Evaluation Teacher Adaptation Survey, February 2019 (for reference)

SPS School Board Action Report on High School Chemistry B Instructional Materials Adoption

Seattle Public Schools is committed to making its online information accessible and usable to all people, regardless of ability or technology. Meeting web accessibility guidelines and standards is an ongoing process that we are consistently working to improve.

While Seattle Public Schools endeavors to only post documents optimized for accessibility, due to the nature and complexity of some documents, an accessible version of the document may not be available. In these limited circumstances, the district will provide equally effective alternate access.

For questions and more information about this document, please contact the following:

MaryMargaret Welch
Curriculum, Assessment, and Instruction
mmwelch@seattleschools.org

The SPS School Board Action Report on the High School Chemistry B Instructional Materials Adoption includes several documents to support the recommendation of the adoption.

Attachment A
Seattle Public Schools High School Science Adoption Communications Plan
September 2018-March 2020

Date	Message	Audience	Channels	Procedures/Notes
September 7, 2018	Announcement of adoption and requests for applications for committee membership. Web page created to outline process and post meeting notes	Families, community members, staff	Direct emails, homepage post, social media, principals, School Beat newsletter	Website was created and linked to Academics page. Request for committee application and participation, emails will be sent to families and teachers through School Messenger and also to media, requests will be posted on the district newsletter, homepage and social media, and program specialists did community outreach.
September 16, 2018	Announcement of adoption process; request for input and support from administrators and staff; anticipate future communications to families	Families, staff	Principal LLD	Principals were asked to inform their school communities about the adoption and encourage applications for adoption committee membership
September to November, 2018	Needs Assessment survey available	Families, community members, staff	Survey/email/webpage	Committee-designed survey on materials priorities to be linked through emails to families and staff. Surveys translated into top 5 languages.
October 2018	Announcement of adoption and requests for applications for committee membership. Web page created to outline process and post meeting notes	School board, staff	Friday memo	Documents posted on an ongoing basis: meeting minutes, survey data, application forms, meeting outcomes, process updates etc.
October 15, 2018	Deadline to apply for Adoption Committee	Families, community members, staff	Direct emails, homepage post, social media, principals, School Beat newsletter	Applications accepted via district website, email, and post

Date	Message	Audience	Channels	Procedures/Notes
October 2018 and ongoing	Adoption Committee progress	Committee, families, community, staff	Adoption webpage, C&I Policy Committee monthly updates	Documents posted on an ongoing basis: meeting minutes, survey data, adoption candidate information, etc.
October 19, 2018	Adoption Committee requests RFP to selected instructional materials	Vendors	Homepage	List of all instructional materials vendors approved by Purchasing will be listed on the webpage.
October to November, 2018	Adoption Committee meetings, minutes posted to website	Families, community members, staff, school board	Homepage, social media, newsletter, principals, Fri Memo	Adoption Committee meeting to orient to standards and develop and revise instructional materials Review Criteria
October to November, 2018	Materials on display in JSCEE library, School Board office, and three selected high schools	Families, community members, staff, school board	Homepage, social media, newsletter, Principals, Friday Memo	When materials are ready, announcement posted to homepage, in newsletter and on social media. Principals provided with an invitation to share with school communities. Feedback forms will be available.
November 13, 2018	Adoption Committee Meeting	Committee, families, community, staff	Adoption webpage	Adoption Committee Meeting: Finalize Selection Criteria
November 14, 2018	Publish Review Criteria Tool	Community members, families, staff	Adoption webpage	Digital version of the Review Criteria Tool posted for public viewing
November 17, 2018	Updates on Adoption Committee meeting outcomes	School board, staff	Friday Memo	Updates on Adoption Committee meeting outcomes
January 2019	Field Test conducted of finalist materials	Families, community members, staff, school board, students	Homepage, social media, newsletter, principals, Fri Memo	Community will be informed of strategy for field test after those details are determined.

Date	Message	Audience	Channels	Procedures/Notes
February 2, 2019	Instructional Materials Open House	Families, community members, staff, school board	Nathan Hale High School	The three program finalists' materials were on display; the Adoption Coordinator, Science Curriculum Specialists, Field Test teachers, and Adoption Committee members were available to interface with the public to guide them through the materials and answer questions
February 9, 2019	Instructional Materials Open House (rescheduled)	Families, community members, staff, school board	Rainier Beach Community Center	This Open House was unfortunately canceled due to adverse weather conditions throughout the Seattle area, and rescheduled for March 2, 2019 at Rainier Beach High School
March 2, 2019	Instructional Materials Open House	Families, community members, staff, school board	Rainier Beach High School	The three program finalists' materials were on display; the Adoption Coordinator, Science Curriculum Specialists, Field Test teachers, and Adoption Committee members were available to interface with the public to guide them through the materials and answer questions
March 2019	Panel Discussion with Field Test Teacher Participants	Open to public	Homepage, social media, newsletter	Audiences will be invited to panel discussion
April 2019	Committee has made recommendation	Families, community members, staff, school board	Homepage, press release, social media, newsletter, Principals, Friday Memo	Documents will be provided directly to the school board. An announcement will be posted to the homepage, in the family newsletter and on social media. A press release will be shared.
Phase 2 – After initial approval from the Board and continued development of the curriculum:				
January-February, 2020	Field Test conducted of District-Developed Instructional Materials	Families, community members, staff, school board, students	Homepage, social media, newsletter, principals, Friday Memo	Field Test conducted at Chief Sealth, Nathan Hale, and Franklin High Schools.
February, 2020	Posted updated CHEM B Adoption Webpage on SPS site	Families, community members, staff, school board	SPS Website	Website provided updated information on the adoption process as well as a virtual Open House, providing members of the public with access to samples of the CHEM B curriculum as well as a feedback form.

Date	Message	Audience	Channels	Procedures/Notes
March, 2020	Student interviews	Families, community members, staff, school board, students	Report to committee	Student panels were conducted to collect student input on the effectiveness of the completed materials.
March, 2020	SPS Communications	Families, community members, staff, school board	SPS Website	SPS Communications Department posted a story regarding the adoption on the website and sent an email to all families.
March, 2020	Open Houses to engage the public in a discussion around the proposed instructional materials	Families, community members, staff, school board, students	2 regional schools: Nathan Hale HS and Chief Sealth HS	Materials were on display and members of the committee were available to guide community members through the materials and answer questions. Feedback was gathered through forms provided in 5 languages.

Attachment B
High School Science Adoption Community Engagement

	Internal Engagement (SPS Staff)			External Engagement (Families/Community)		
	Tier 1 Inform	Tier 2 Consult/ Involve	Tier 3 Collab.	Tier 1 Inform	Tier 2 Consult/ Involve	Tier 3 Collab.
Stage 1						
Adoption Committee Application Process			X		X	
SPS Staff and Community/Family Input Survey *(translations of forms available)*		X			X	
Instructional Materials Public Display and Community Input *(translations of forms available)*		X			X	
SPS Staff and Community Information Session Open House		X			X	
Adoption Committee Review/Evaluation of Instructional Materials			X			X
SPS Science Adoption website updates	X			X		
SPS Communication updates (email, SPS website)	X			X		
Field Test						
Field Test Teacher Application Process			X	X		
SPS Science Adoption website updates	X			X		
SPS Communications updates (email, SPS website)	X			X		
Stage 2						
Field Test Teacher Panel Interview			X			
Adoption Committee Review/Evaluation of Instructional Materials Finalists		X			X	
SPS Science Adoption website updates	X			X		
SPS Communication updates (email, SPS website)	X			X		

Attachment C
High School Science Adoption Committee Membership Roster, Established October, 2019
Staff Membership

Name	Title	School	Years in Education	Professional Experience	Children attending SPS
India Carlson	Teacher (Biology, CTE)	Ballard HS	12		
Kim Dinh	Teacher (Biology)	Chief Sealth HS	9		
Lura Ercolano	Teacher	Middle College			
Daniel Fisher	Teacher (Physics)	Ingraham HS	9		
Jen Fox	Teacher (Biology)	Hamilton MS	15		2
Neil, Rebecca	Teacher (Chemistry)	Chief Sealth HS	6		
Margaret Jones	Teacher (Chemistry)	Garfield HS	11		
Yolanda Jones	Teacher (Chemistry)	Franklin HS	2		
Jackie Wilson	Teacher (Biology and Physical Sci)	Roosevelt HS	3		
AJ Katzaroff	Teacher (Biology)	Franklin HS	7	PhD Molecular & Cellular Biology	Gatewood (3rd, 4th)
Greg Kowalke	Teacher (Biology)	Cleveland HS	4	Biological oceanographer	
Laura McGinty	Teacher (Biology)	Ballard HS	5		
Ruth Medsker	Principal	Lincoln HS			
Tiffany Robinson	Teacher (Biology)	Nathan Hale HS	10		
Emily Wang	Teacher (Instructional Technology)	JSCEE	9		1
Autumn Tocchi	Teacher (Chemistry)	Rainier Beach HS	2		
Brian Vance	Principal	West Seattle HS			2

Staff Membership Demographics
17 total staff members (some chose not to provide this optional information):

- 11 identify as female (64.7%)
- 3 identify as male (17.6%)
- 11 identify as White (64.7%)
- 4 identify as non-White (17.6%)
- 6 represent Title I schools (35.3%)
- 1 represents HCC schools (5.9%)

Attachment D
High School Science Adoption Committee Membership Roster
Community Membership

Name	Professional Affiliations	Children attending SPS
Nina Arens	Development Lead for Education programs at Living Computers Museum + Labs	Roosevelt (9th)
Laura Bailey	NatureBridge; Enhancing Education Through Technology	
Philip Bell	UW School of Education	Nathan Hale (11th)
Judy Bridges	Chemical Engineer; Mechanical Engineer; Electrical Engineer	Washington (6th)
Brian Buchwitz	Senior Lecturer, UW Biology; PhD in Molecular & Cellular Biology	Gatewood (2nd, 3rd)
~~Kristen Dang~~	Computational Biologist in cancer research	John Muir (4th, 4th)
Monica Fujii	Microbiology; MPH in Public Health Genetics	Arbor Heights (2nd)
Fernando Gonzalez	PhD Oceanography; Postdoc in Biophysics	McDonald (2nd)
Christine Helkey	Physician	Center School (10th)
Pam Kraus	PhD in Physics; Educational Consultant	Garfield (12th)
Christopher Lausted	Senior Research Engineer at Institute for Systems Biology	Ballard (10th)
Ryan Miller	UW Tacoma Biology instructor	Graham Hill (1st)
Stephen Montsaroff	Doctorate in Physics; Experience in Education	Garfield (12th), Washington (8th)
Maureen Munn	Retired science educator, UW Dept. of Genome Sciences	
Jessica Thompson	UW School of Education	
John Wietfeldt	Retired professional chemist	

Community Membership Demographics
17 total community members (some chose not to provide this optional information):

- 9 identify as female (52.9%)
- 5 identify as male (29.4%)
- 1 identifies as transgender female (5.8%)
- 13 identify as White (76.5%)
- 3 identify as non-White (17.6%)
- 3 represent Title I schools (17.6%)

Attachment D
High School Science Adoption Committee Membership Roster
Student Membership

Name	High School
Nahom Alemayehu	Franklin HS (11th)
Aiden Buchanan	The Center School (10th)
Sofia Nguyen	Franklin HS (11th)

Student Membership Demographics
3 total student members:

- 1 identifies as female (33.3%)
- 2 identify as male (66.6%)
- 0 identify as White (0.0%)
- 3 identify as non-White (100.0%)
- 0 represent Title I schools (0.0%)
- 0 represent HCC schools (0.0%)

Attachment D: SPS Science Instructional Materials Adoption
HS Review Criteria v6.7.11.29.18 ADA-Compliant Version

Vendor: _____

Program Name: _____

CATEGORY 1: STANDARDS ALIGNMENT

WHY: "Educational excellence and equity for every student is Goal One of our district's Strategic Plan. Our academic program is grounded in standards-based curriculum, with strong, targeted instruction delivered by highly-qualified teachers to ensure that every student graduates ready for college, career, and life." – SPS Department of Curriculum, Assessment, and Instruction website

WHAT: "Our mission is to provide all SPS science classrooms with a common NGSS-aligned core scope and sequence that is engaging, authentic, culturally responsive, rigorous, and technology-based to be college and/or career ready. Our goal is that all our students will be scientifically literate. This is accomplished through a collaborative, interactive, rigorous science program responsive to the needs of diverse learners." – SPS Science Department Mission Statement

RUBRIC:
4: Superior Evidence; **3:** Strong Evidence; **2:** Moderate Evidence; **1:** Minimal Evidence; **0:** No Evidence

Category 1 Criterium	Current	Scientifically accurate	Grade-level appropriate	Average Score
1. The instructional materials present the SEPs (Science and Engineering Practices) in a way that is:				
2. The instructional materials present the DCIs (Disciplinary Core Ideas) in a way that is:				
3. The instructional materials present the CCCs (Crosscutting Concepts) in a way that is:				

Category 1 Criterium	Evidence Gathered	Rating
4. The instructional program provides phenomena-based science units.	Evidence:	Rating:
5. The instructional program engages students in the engineering design process by solving engineering problems.	Evidence:	Rating:

Category 1 Criterium	Evidence Gathered	Rating
6. Units are organized in a coherent, sense-making sequence (storyline), anchored by a phenomenon or engineering problem that allows for students to develop and build knowledge to explain the phenomenon or solve the engineering problem.	Evidence:	Rating:
7. Courses are designed around an instructional arc that supports the development of students' conceptual understanding.	Evidence:	Rating:
8. Phenomena and/or engineering problems engage students as directly (first hand) as possible.	Evidence:	Rating:
9. Individual learning activities include Science and Engineering Practices (SEPs) and Disciplinary Core Ideas (DCIs), with Crosscutting Concepts (CCCs) used to unify activities.	Evidence:	Rating:
10. The instructional program provides opportunities for students to collect evidence using all of the following: computer-based simulations, hands-on investigations, field investigations, informational texts, and other media.	Evidence:	Rating:
11. Instructional materials draw upon students' prior knowledge and experiences related to the targeted learning of SEPs, DCIs, and CCCs.	Evidence:	Rating:
12. Instructional materials provide students with opportunities to consider the ethical implications of science where appropriate.	Evidence:	Rating:
13. The instructional program indicates connection(s) to the Common Core State Standards.	Evidence:	Rating:

Category 1 Criterium	Evidence Gathered	Rating
14. The instructional program requires students to use and build their knowledge of Disciplinary Core Ideas as assigned to each course: a. (Circle one) Biology, Chemistry, Physics b. Earth and Space Science (Applies to all content areas reviewed) c. Engineering, Technology, and Application of Science (Applies to all content areas reviewed)	Evidence:	Rating:
14. The instructional program requires students to use, leverage, and build their knowledge of the Science and Engineering Practices: a. SEP 1: Asking Questions (science) and Defining Problems (engineering) b. SEP 2: Developing and Using Models c. SEP 3: Planning and Carrying Out Investigations d. SEP 4: Analyzing and Interpreting Data e. SEP 5: Using Mathematics and Computational Thinking f. SEP 6: Constructing Explanations (science) and Designing Solutions (engineering) g. SEP 7: Engaging in Argument from Evidence h. SEP 8: Obtaining, Evaluating, and Communicating Information	Evidence:	Rating:
15. The instructional program requires students to use and build their knowledge of the Crosscutting Concepts: a. CCC 1: Patterns b. CCC 2: Cause and Effect c. CCC 3: Scale, Proportion, and Quantity d. CCC 4: Systems and System Models e. CCC 5: Energy and Matter f. CCC 6: Structure and Function g. CCC 7: Stability and Change	Evidence:	Rating:

Category 1 Criterium	Evidence Gathered	Rating
Total Score for Category 1:	**Points Possible: 64**	**% Score:**

Comments: **Personal % Score:**

CATEGORY 2: ASSESSMENTS

WHY: "The Board of Directors of Seattle Public Schools … believes that assessments are a critical component of our education system used to inform instruction through identification of student strengths, assessment of learning growth, and diagnosis of barriers, and areas of support." – SPS School Board Policy #2080

WHAT: Includes pre-, formative, summative, self-, and peer-assessment measures that assess three-dimensional learning that provides data used to inform instruction.

RUBRIC:
4: Superior Evidence; **3:** Strong Evidence; **2:** Moderate Evidence; **1:** Minimal Evidence; **0:** No Evidence

Category 2 Criterium	Evidence Gathered	Rating
1. Assessments engage students in at least two of the three dimensions of teaching and learning: The Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs).	Evidence:	Rating:
2. Assessments do not create barriers to student success based on gender identification, cultural status, socioeconomic status, sensitivity, language, learning exceptionality, or the use of adaptive technology.	Evidence:	Rating:
3. Assessments can be modified for language learners and students with learning exceptionalities.	Evidence:	Rating:
4. Assessments are written in a way that makes the assessed standards visible to learners.	Evidence:	Rating:
5. Pre-assessments for each unit are provided to elicit students' prior knowledge and preconceptions.	Evidence:	Rating:
6. 3D assessment tools include multiple measures of student progress within a unit.	Evidence:	Rating:

Category 2 Criterium	Evidence Gathered	Rating
7. Formative assessments are embedded consistently within the unit of instruction to yield frequent information teacher may use in planning and modifying instruction and are designed to elicit understanding to provide evidence of students' progress toward mastering the three-dimensional learning.	Evidence:	Rating:
8. 3D summative assessments, at the end of a chapter or a unit, require students to provide a gapless scientific explanation for the unit phenomenon, supported by evidence.	Evidence:	Rating:
9. 3D summative assessments involve a variety of modalities, including, but not limited to: hands-on or simulation-based performance tasks, open-ended constructed response problems, and scoring of portfolios of student work collected over the course of instruction.	Evidence:	Rating:
10. Tools are provided for scoring assessment items (e.g., sample student responses, rubrics, scoring guidelines) and are connected to standards in student-friendly language.	Evidence:	Rating:
11. Guidance is provided for interpreting the assessments (e.g., determining what high and low scores mean for students) that allow for interpretation of levels of student understanding.	Evidence:	Rating:
12. Instructional materials provide opportunities and guidance for oral and/or written self-assessment allowing students to monitor their own learning.	Evidence:	Rating:
13. Instructional materials include opportunities to use digital tools to assess three-dimensional learning to provide timely feedback to students.		

Category 2 Criterium	Evidence Gathered	Rating
Total Score for Category 2:	**Points Possible: 52**	**% Score:**

Comments: **Personal % Score:**

CATEGORY 3: INCLUSIVE EDUCATIONAL PRACTICES

WHY: "The district shall provide every student with equitable access to a high-quality curriculum, support, facilities, and other educational resources." – SPS School Board Policy #0030

WHAT: Instructional materials support students with learning variabilities, including, but not limited to, standard English learners, English learners, long term English learners, students living in poverty, foster youth, girls and young women, advanced learners, students with disabilities, students experiencing trauma, students below grade level, and students of Native American, Alaskan, Pacific Islander, African American, and Latinx descent.

RUBRIC:
4: Superior Evidence; **3:** Strong Evidence; **2:** Moderate Evidence; **1:** Minimal Evidence; **0:** No Evidence

Category 3 Criterium	Evidence Gathered	Rating
1. Instructional materials leverage students' prior knowledge and experiences by eliciting and revisiting their ideas throughout the unit.	Evidence:	Rating:
2. Instructional materials should build upon student interests and identities and include options for how to connect instruction to students' home, neighborhood, community, and/or culture, with a lens on social justice issues that are pertinent to students' lives (e.g., food deserts).	Evidence:	Rating:
3. Instructional materials are designed to leverage diverse cultural and socioeconomic backgrounds (e.g., phenomenon relates to students from multiple backgrounds) and experiences of students, including honoring the ways they come to know science (e.g., Native American generational storytelling).	Evidence:	Rating:

Category 3 Criterium	Evidence Gathered	Rating
4. Instructional materials provide an intentional balance of a wide variety of activities within a unit (e.g., simulations, hands-on activities, readings, discourse, kinesthetic activities, field investigations, etc.) to support students' sense-making in the construction of explanations of the phenomena.	Evidence:	Rating:
5. Teacher resources provide scaffolds for full participation by students of all capabilities.	Evidence:	Rating:
6. Instructional materials provide appropriate accommodations and modifications to support all students in accessing information in the learning of science and engineering (e.g., reading strategies, accessing complex text, identifying language functions).	Evidence:	Rating:
7. Students have opportunities to express their understanding of phenomena using multiple modalities, including, but not limited to, discussing, writing, gesturing, and drawing.	Evidence:	Rating:
8. Instructional materials are available in multiple languages.	Evidence:	Rating:
9. Instructional materials provide opportunities for students to explore science and engineering career pathways that are connected to their lives through relevance and authenticity.	Evidence:	Rating:
10. Instructional materials integrate technology-based, value-added tools that address issues of equitable access and support the growth of digital literacy skills and engagement for all students.	Evidence:	Rating:

Category 3 Criterium	Evidence Gathered	Rating
11. Instructional materials include a global perspective, referencing work and innovations in the fields of science and technology done by people from different global societies and describing how different global communities experience, and are impacted by, science and engineering.	Evidence:	Rating:
12. Instructional materials involve students in ethical discussions about science innovations that have exploited groups in history, in order to engage in restorative justice and prevent similar situations in the future.	Evidence:	Rating:
13. Instructional materials engage students in ethical discussions related to the science and engineering topic being studied, including humankind's responsibility to the ecosystem, the ethical treatment of human subjects and vertebrate animals in research, and the ethical conduct of research.	Evidence:	Rating:
Total Score for Category 3:	**Points Possible: 52**	**% Score:**

Comments: **Personal % Score:**

CATEGORY 4: EVALUATION OF BIAS CONTENT

WHY: "As schools work to increase success for all students, it is important to recognize the impact of bias in classrooms, instructional materials, and teaching strategies. Evaluating for bias requires us to learn about others and to respect and appreciate the differences and similarities." – WA OSPI Equity & Civil Rights Task Force

WHAT: Criteria adapted from the Washington Models for the Evaluation of Bias Content in Instructional Materials, WA OSPI Equity & Civil Rights Task Force (Appendix A)

RUBRIC:
4: Superior Evidence; **3:** Strong Evidence; **2:** Moderate Evidence; **1:** Minimal Evidence; **0:** No Evidence

Instructions (Criteria 1-5):
The column categories are umbrella terms meant to encompass all examples to consider while reviewing the instructional materials. For categories represented, evaluate the level of evidence for each of the components: A: Gender; B: Sexual Orientation; C: Ethnicity; D: Culture; E: Physical Disability; F: Physical Characteristics; G: Age; H: Family Structure; I: Socioeconomic Status; J: Geographic Setting.

Category 4 Criterium	A	B	C	D	E	F	G	H	I	J	Average
1. Reflect qualities such as collaboration, compassion, intelligence, imagination, and courage.											
2. Represented as central characters in narratives and illustrations.											
3. Shown in active decision-making and leadership roles.											
4. Shown performing similar work in related fields.											
5. Referred to by their names and roles, not their characteristics.											

Category 4 Criterium	Evidence Gathered	Rating
6. Materials include historical and current contributions to science and engineering by members of non-dominant cultures.	Evidence:	Rating:
7. Groups are identified in gender-neutral language (example: 'firefighter' instead of 'fireman').	Evidence:	Rating:

Category 4 Criterium	Evidence Gathered	Rating
8. People of all genders are depicted in non-traditional as well as traditional roles in the family, at work, in leisure activities, and in attitude.	Evidence:	Rating:
9. Persons with disabilities are shown working and playing as equals with those around them.	Evidence:	Rating:
10. Where appropriate, instructional materials acknowledge when the dominant culture took credit for discoveries and work done by non-dominant cultures.	Evidence:	Rating:
Total Score for Category 4:	**Points Possible: 40**	**% Score:**

Comments: **Personal % Score:**

CATEGORY 5: INSTRUCTIONAL PLANNING AND SUPPORT

WHY: "[The District will] align instruction, mentoring, evaluation, and support to ensure each and every educator develops strong foundational teaching skills." – SPS Formula for Success

WHAT: "Educators must possess a repertoire of evidence-based instructional strategies in delivering the curriculum to develop talent, enhance learning, and provide students with the knowledge and skills to become independent, self-aware learners, and to give students the tools to contribute to a multicultural, diverse society. The curriculum, instructional strategies, and materials and resources must engage a variety of learners using culturally responsive practices." – The National Association for Gifted Children website

RUBRIC:
4: Superior Evidence; **3:** Strong Evidence; **2:** Moderate Evidence; **1:** Minimal Evidence; **0:** No Evidence

Category 5 Criterium	Evidence Gathered	Rating
1. Teacher support materials provide coherent learning progressions within and between units.	Evidence:	Rating:
2. The instructional program includes features that help teachers understand how the Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs) work together to support students' sense making.	Evidence:	Rating:
3. Instructional materials document how each unit aligns to English/Language Arts and Math Common Core State Standards.	Evidence:	Rating:
4. Instructional materials contain teacher guidance on how learning activities relate to the unit storyline and relevant phenomenon, including when in the unit to have students revise their thinking.	Evidence:	Rating:
5. The instructional program provides guidance to teachers on how to engage students in a variety of discourse strategies to support their three-dimensional learning.	Evidence:	Rating:

Category 5 Criterium	Evidence Gathered	Rating
6. Teachers are provided with a wide variety of engaging, student-centered learning activities that help students make sense of phenomena or in designing solutions to related problems.	Evidence:	Rating:
7. The instructional program contains teacher guidance, with annotations and suggestions, for how to successfully implement their units and daily lesson plans, including common issues that arise and how to respond to them.	Evidence:	Rating:
8. Instructional materials contain explanations of the instructional approaches of the program and identification of the research supporting the approach.	Evidence:	Rating:
9. Instructional materials include research on the effectiveness of the program.	Evidence:	Rating:
10. Teacher support materials provide background knowledge related to the scientific content and engineering design process in each lesson.	Evidence:	Rating:
11. Where applicable, teacher background knowledge materials include a global and local perspective.	Evidence:	Rating:
12. Teacher support materials identify common student preconceptions and suggestions for how to provide feedback and engage students in meaning-making that addresses these preconceptions.	Evidence:	Rating:
13. Teacher support materials ensure three-dimensional learning by identifying: opportunities for checking for understanding, when to revisit students' initial ideas, and methods of responsive instruction.	Evidence:	Rating:

Category 5 Criterium	Evidence Gathered	Rating
14. Teacher support materials provide regular updates to content, phenomena, assessments, and pedagogy.	Evidence:	Rating:
15. Instructional materials include a comprehensive list of consumable and non-consumable supplies needed, as well as a detailed list of preparation tasks, for each lesson.	Evidence:	Rating:
16. Instructional materials embed clear science safety guidelines for teachers and students across all lessons that are consistent with science safety rules and regulations, when appropriate, lab safety sheets are provided, and digital safety concerns and guidelines are addressed.	Evidence:	Rating:
17. Instructional materials designated for each course are appropriate for one semester, and teacher support materials contain suggested pacing for the semester.	Evidence:	Rating:
18. Instructional materials contain strategies for informing students, parents, and caregivers about the science program that are culturally respectful.	Evidence:	Rating:
19. Technology Criteria: a. Instructional materials encourage the meaningful use of digital technologies and tools (such as video clips, sensors, and computer simulations) to investigate and document phenomena that cannot be directly experienced in the classroom, as well as tools used to record, display, and analyze data.	Evidence:	Rating:
b. Instructional materials provide strategies for effective implementation and management of instructional technology tools.	Evidence:	Rating:

Category 5 Criterium	Evidence Gathered	Rating
c. Instructional materials include or reference digital technology that provides opportunities for teachers and students to collaborate with each other (e.g., websites, discussion groups, webinars, simulations, data visualization software, cloud-based collaborative tools, etc.).	Evidence:	Rating:
Electronic learning resources support instruction by: d. indicating which lessons require technology. e. having a well-designed user interface. f. providing technical support. g. including suggestions for appropriate use. h. including back up plans that do not require technology.	Evidence:	Rating:
Total Score for Category 5:	**Points Possible: 76**	**% Score:**

Comments: **Personal % Score:**

Attachment D: SPS Science Instructional Materials Adoption
HS Review Criteria v6.7.11.29.18 ADA-Compliant Version

Category	% Score	X 100 =	Points	X	Weighting	=	Score
Category 1: Standards Alignment		**X 100 =**		**X**	**0.24**	**=**	
Category 2: Assessments		**X 100 =**		**X**	**0.20**	**=**	
Category 3: Inclusive Educational Practices		**X 100 =**		**X**	**0.17**	**=**	
Category 4: Evaluation of Bias Content		**X 100 =**		**X**	**0.16**	**=**	
Category 5: Instructional Planning and Support		**X 100 =**		**X**	**0.23**	**=**	

Program Total:
(attach any additional notes)

Comments:

Attachment E
High School Science Adoption Committee
Process, Protocol, and Results of Instructional Materials Review

In keeping with School Board Policy 2015, Selection and Adoption of Instructional Materials, and the commitment to provide all Seattle Public School students and teachers with the best possible high school science instructional materials and narrow the opportunity gap for historically underserved students, the School Board instructed the science content area of Curriculum, Assessment, and Instruction to launch a high school science instructional materials adoption in September 2018. The adoption process was carried out over a 9-month period and proceeded according to guidelines outlined in School Board Policy 2015. The process occurred in three phases: Stage 1, Field Test, and Stage 2 (see Attachment F).

In October of 2018, a high school Science Adoption Committee, comprised of teachers, school leaders, parents, professionals in STEM fields, and other community members, was selected through an application process to ensure a committee that represented the diversity of stakeholders in the District, including geography, race, ethnicity, gender, and age (see Attachment D).

Review Criteria Tool

The K-8 Adoption Committee members identified five categories and 74 specific criteria for evaluation of program candidates, based on the needs, priorities, data, and research that emerged from the following sources:

- 2013 Washington State Science Learning Standards (adopted from the 2013 Next Generation Science Standards)
- Preliminary Family/Community and Teacher/Staff Needs Assessment and input survey, which identified priorities around science materials, instruction, and learning in the District
- A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (National Research Council [NRC] of the National Academy of Sciences)
- The Educators Evaluating the Quality of Instructional Products Rubric (EQuIP) for Science
- Primary Evaluation of Essential Criteria (PEEC) for NGSS Instructional Materials Design
- California's Science Instructional Materials Rubric
- Anti-Bias Criteria Screen Tool outlined in Board Policy 2015
- Washington OSPI Equity & Civil Rights Task Force's Models for the Evaluation of Bias Content in Instructional Materials tool
- SPS Formula for Success

The first draft of the tool was created on May 4, 2018. A second version of tool was created after receiving initial K-8 Committee input on June 9, 2018 and June 13, 2018. A third version of the

tool was created by a subcommittee on June 26, 2018, continuing modifications suggested by the K-8 Committee as well as utilizing components of a draft version of a new, comprehensive rubric created by the nonprofit edReports.org. A fourth and final version resulted from a final review by the K-8 Adoption Committee in September of 2018. The categories were weighted, and a final draft of the Science Instructional Materials Review Criteria (see Attachment E) was presented to the SPS Instructional Materials Committee (IMC) for feedback and the final draft approved for use as the committee's evaluation tool of candidate programs.

The High School Adoption Committee used the K-8 version of the Review Criteria as the basis of their work to develop their own set of criteria. Revision work began at the Committee's meeting on October 27, 2018 and continued until the meeting on November 30, 2018.

The weighted review criteria categories included:

- Category 1: Standards Alignment (24%)
- Category 2: Assessments (20%)
- Category 3: Inclusive Educational Practices (17%)
- Category 4: Evaluation of Bias Content (16%)
- Category 5: Instructional Planning and Support (23%)

Stage 1: RFI

In October of 2018, vendors responded to the District's initial RFI, which targeted the following courses: BIO A, BIO B, CHEM A, CHEM B, PHYS A, and PHYS B. The following vendors sent formal responses:

Company	**Program**	**Course(s)**
Accelerate Learning, Inc.	STEMScopes	All courses
Bedford, Freeman & Worth (BFW)	Living By Chemistry	CHEM A / B
Michigan State University	Carbon TIME	BIO A
Discovery Education, Inc.	Discovery Science	All courses
Houghton Mifflin Harcourt (HMH)	HMH Science Dimensions	All courses
McGraw-Hill Education	Inspire Science	All courses
PASCO Scientific	Essential Physics Essential Chemistry	PHYS A, B CHEM A, B
Pearson Education, Inc.	Miller and Levine Biology Pearson Chemistry	BIO A, B CHEM A, B
University of Colorado Boulder	Physics through Evidence: Empowerment through Reasoning (PEER)	PHYS A, B

Two programs developed by District science teachers, in collaboration with university partners, were also presented to the Committee: one for BIO B and one for CHEM A.

Stage 1 Review Protocol

In December of 2018, the Committee worked collaboratively in small review teams to evaluate the program candidates, using the Science Instructional Materials Review Criteria. The Committee was split into 3- to 4-person teams, with three teams created for each of the three content areas: Biology, Chemistry, and Physics. These nine teams were also balanced between staff and community members. Each team reviewed a randomly-assigned program within their content area, using the Review Criteria Tool to record their scoring and supporting evidence. As teams completed their reviews, the data was digitally collected and collated for the record. The results of each review were kept confidential, so that subsequent reviews would not be influenced by the work of previous teams.

When evaluating a program, review teams assigned each criteria a quantitative score between 0 and 4, using the scoring rubric established by the Committee, and included annotations based on evidence collected directly from their review of the materials. The score was calculated for each category and weighted based on the above percentages. A total score was then calculated by the review team for that vendor program.

Due to the breadth and depth of the criteria contained within the five categories within the Review Criteria, a protocol was proposed in which a vendor program could be eliminated from consideration if two separate review teams, independent from each other and without knowledge of each other's work, reached consensus that the candidate program did not meet the minimum alignment to science standards or anti-bias content and should not be eligible for consideration. If this condition was met, the program would be eliminated from the candidate pool. The committee voted unanimously to approve this protocol as an amendment to the Review Criteria scoring protocol. After each candidate vendor program was reviewed by two independent review teams, the total scores for each vendor program were averaged and ranked (see Attachment F).

Stage 1: RFP Step 1

In December of 2018, vendors responded to Step 1 of the District's RFP process. All vendors still in consideration responded, however, Discovery Education and BFW were removed from consideration by Purchasing due to their failure to comply with the requirements of the RFP process. The Committee was informed of this development.

At the end of the first round of review, the following programs were eliminated from consideration based on the "two strikes" protocol:

Biology:

Company	**Program**	**Review Score (%)**
McGraw-Hill Education	Inspire Science	**21.6**

Chemistry:

Company	**Program**	**Review Score (%)**
Houghton Mifflin Harcourt (HMH)	HMH Science Dimensions	**27.3**
PASCO Scientific	Essential Chemistry	**11.8**
Pearson Education, Inc.	Pearson Chemistry	**7.2**

Physics:

Company	Program	Review Score (%)
Houghton Mifflin Harcourt (HMH)	HMH Science Dimensions	**17.3**
McGraw-Hill Education	Inspire Science	**27.7**
PASCO Scientific	Essential Physics	**5.2**

At the final stage of Round 1, the Committee met to review the materials still in consideration one final time, and to determine which programs to elevate to Round 2 and the Field Test component of the process. The Committee unanimously voted to elevate the following programs:

Company	Program	Course	Review Score (%)
Michigan State University	Carbon TIME	BIO A	**56.8**
SPS Teacher-Developed	BIO B Curriculum	BIO B	**52.1**
University of Colorado Boulder	PEER	PHYS A / B	**42.7**

The Committee voted to elevate the following programs for Chemistry, based on the voting below:

Company	Program	Course	Review Score (%)	Votes
SPS Teacher-Developed	CHEM A Curriculum	CHEM A	**35.1**	**11 yes, 1 no**
Accelerate Learning, Inc.	STEMScopes	CHEM A / B	**37.4**	**7 yes, 5 no**

The McGraw Hill program received a vote of 3 yes and 8 no, with 1 abstaining, and was therefore not elevated to the Field Test.

Stage 2: RFP Step 2 and Field Test

The finalist vendors were contacted by the District and asked to respond to RFP Step 2.

All SPS high school science teachers were invited to apply to participate in the High School Science Adoption field test pending principal approval and demonstration of understanding of the 2013 Washington State Science Learning Standards. 21 teachers and their students, representing a diversity of years in the profession, science background, gender, and ethnicity, were selected by the Adoption Coordinator to teach the field test unit in their classrooms. The field test classrooms included over 1000 students from 12 SPS middle and high school buildings located in multiple regions of the district, and represented Seattle Public Schools' diverse racial, ethnic, and socioeconomic groups and student populations, including English Language Learners, Special Education, HCC, and general education (see Attachment H).

The 21 field test teachers were instructed to implement and instruct a pre-selected unit from one of the three candidate programs. Units were selected along a common content area and set of Disciplinary Core Ideas (DCIs) to allow for a common frame of reference for evaluation. The units selected are detailed below:

Program	**Grade**	**Unit**	**# of Classrooms**
Carbon TIME	BIO A	Human Energy Systems	5
Teacher-Developed BIO B	BIO B	Development	3
Teacher-Developed CHEM A	CHEM A	Atomic Structure	4
PEER	PHYS A	Magnetism	4
PEER	PHYS B	Energy	3
STEMScopes	CHEM A	Atomic Structure	4
STEMScopes	CHEM B	Periodic Trends	3

Field test teachers received a full day of training from the vendor including follow-up time to plan and calendar their unit with their field test colleagues.

Field test teachers were given the following guidelines and expectations for field test participation in order to ensure the validity of the field test and provide multiple data collection opportunities (see Attachment I) about each candidate program:

- Implement the unit with as much fidelity as possible
- Submit feedback via digital survey platform on a weekly basis about the effectiveness of learning activities, standards alignment, and student engagement.
- Work with the Adoption Coordinator and Science Curriculum Specialists to schedule a lesson observation and participate in a post-observation interview
- Select a small student focus group to be interviewed about their experience with the field test unit
- Have all students participating in the field test complete an end-of-unit student survey around the following attributes:
    - Engagement in standards-aligned science practices

    - Using instructional materials that are organized around a conceptual storyline and anchored by a puzzling science phenomena problem to solve
    - Sharing science ideas through student discourse
    - Relevance in science learning
    - Equity, Identity, and Disposition
- Administer and score the provided pre-unit and post-unit assessments and record student scores to quantify student growth
- Participate in a panel interview session with the Adoption Committee

The following schools were involved in the Field Test:

School	**Field Test(s)**
Ballard High School	PHYS A, PHYS B
The Center School	BIO A, BIO B, PHYS B
Chief Sealth International High School	CHEM A, PHYS A, PHYS B
Cleveland High School	CHEM A
Franklin High School	BIO A, BIO B, CHEM A, CHEM B, PHYS A
Garfield High School	BIO A
Hamilton International Middle School	BIO A (HCC), CHEM A (HCC)
Jane Addams Middle School	PHYS A (HCC)
Nathan Hale High School	CHEM A
Rainier Beach High School	CHEM A, CHEM B
Robert Eagle Staff Middle School	CHEM A (HCC)
Roosevelt High School	BIO B

Stage 2: Committee Final Recommendations

During the course of final review and analysis of all data collected for each candidate program, Adoption Committee members completed a survey in which they provided input about how each category of data collected during Stage 1 and the Field Test Stage of the adoption process should be weighted (see Attachment J), for each separate course. When the Committee member input was averaged, the weights were assigned to each data set as follows:

Course	**Review Criteria**	**Field Test Data**	**Public Input**
BIO A	34.0%	55.9%	10.1%
BIO B	33.6%	63.9%	2.5%
CHEM A	33.4%	52.5%	14.1%
CHEM B	33.6%	60.0%	6.4%
PHYS A and B	38.2%	56.6%	5.2%

On March 13 and 16, 2019, the Adoption Committee participated in panel interview sessions with the field test teachers of each candidate program. Each field test reported to the Committee about their experience implementing the candidate program they field tested and their perception of their students' experience, and to provide input and feedback about the instructional materials in that program. In the panel interview, field test teachers were asked a set of 23 questions aligned with Science Instructional Materials Review Criteria categories and criteria by the Adoption Coordinator. Adoption Committee members were allowed to ask follow-up questions of the field test panels. Committee members were instructed to record notes during the panel interview for each candidate program as a source of evidence about the outcomes of the field test stage of the adoption.

Following each teacher panel, the Adoption Committee worked in small teams to review additional data sources generated from the Field Test stage for evidence of alignment with the Science Instructional Materials Review Criteria, including post-observation teacher interviews, student focus group interviews, end-of-unit student attribute surveys, and student growth data as measured by pre and post-unit assessments. Committee members worked in review teams to collectively synthesize and review all of the data then assign each program a Field Test score between 0 and 4 in each of the five categories in the Science Instructional Materials Review Criteria (see Attachment E). The score for each category was weighted then tallied and reported as a consensus score.

Committee members then reviewed input from the public. Members of school communities and the public were invited to review instructional materials from each vendor program under consideration for adoption and to provide input about these materials. The input forms were collected through the SPS Science Adoption website, at one of the five instructional materials public display site across the district, and at two open house information sessions. Of the Community Input Forms submitted, 1 was completed for PEER (PHYS A), 2 for Carbon TIME (BIO A), and 1 for Teacher-Developed CHEM A. Although the amount of data generated for each vendor program was very small, review teams analyzed the input forms for each finalist vendor program and assigned a Public Input score between 0 and 4 in each of the five categories in the Science Instructional Materials Review Criteria (see Attachment E) based on the comments. The score for each category was weighted then tallied and reported as a consensus score.

Each committee review team calculated their weighted consensus scores for the Review Criteria scores from Stage 1, the Field Test data, and the Public Input data including annotated evidence collected from the data to support their scores. Each review team reported their scores and supporting evidence as to the other committee review teams. The committee identified patterns and trends across all review team reports and each review team tallied their three final scores to report a total score for each candidate finalist program. The Adoption Committee then proceeded to the decision-making phase. Adoption Committee members agreed to an anonymous vote to either identify a single finalist for recommendation for adoption to the school board for each of the courses or to recommend no Adoption.

Based on the synthesis and summary of all data reviewed by the committee and the final scores reported, PEER was recommended for Adoption for PHYS A and PHYS B; Carbon TIME was recommended for Adoption for BIO A; Teacher-Developed curriculum was recommended for Adoption for BIO B; and Teacher-Developed curriculum was recommended for Adoption for CHEM A. The Committee did not recommend Adoption of a curriculum for CHEM B at this

time. The Committee also moved to recommend that the Board provide funding to support teacher collaboration through professional development in support of continuing work on the Teacher-Developed curriculum for both CHEM A and CHEM B.

Stage 3: 2019-2020 Continued Work on CHEM B Curriculum

After being approved by the Board, the work on the District-Developed CHEM B curriculum continued as planned. Chemistry teachers met over the summer for two weeks to continue the development of the instructional materials. The work continued into the 2020 academic year, with two release days for the teachers to continue the work and an allocation of 0.1 FTE Science Specialist to work toward the completion of the online resources.

An addendum to the adoption timeline and the communications plan was submitted and approved by the Instructional Materials Committee. In the meantime, the materials were put on display on the SPS website for a period of four weeks, SPS Communications issued a press release, and participating teachers sent information home to families to inform them of the display. Two Community Open Houses were held at the beginning of March to allow families to discuss the materials with the teachers that helped to develop the curriculum. The curriculum was field tested in two high school classrooms. SPS Curriculum Specialists visited those classrooms to observe lessons and to interview students, as per the procedures developed during the 2019 adoption. Students were also asked to complete a survey sharing their impressions of science.

Stage 4: Committee Final Recommendations

The Adoption Committee reconvened on March 14, 2020 to review the completed District-Developed Curriculum for CHEM B as well as the results of the field test and the collected community feedback. The committee used the same protocols as were developed for the 2019 adoption and worked in teams to review the curriculum using the comprehensive Review Criteria tool (Attachment D) also used during the 2019 adoption. The Committee deliberated and at a meeting on March 16, 2020, voted unanimously to recommend to the Board that the District-Developed instructional materials be adopted for use in all district high school CHEM B classrooms.

Attachment F
Community Input Form Summary Report

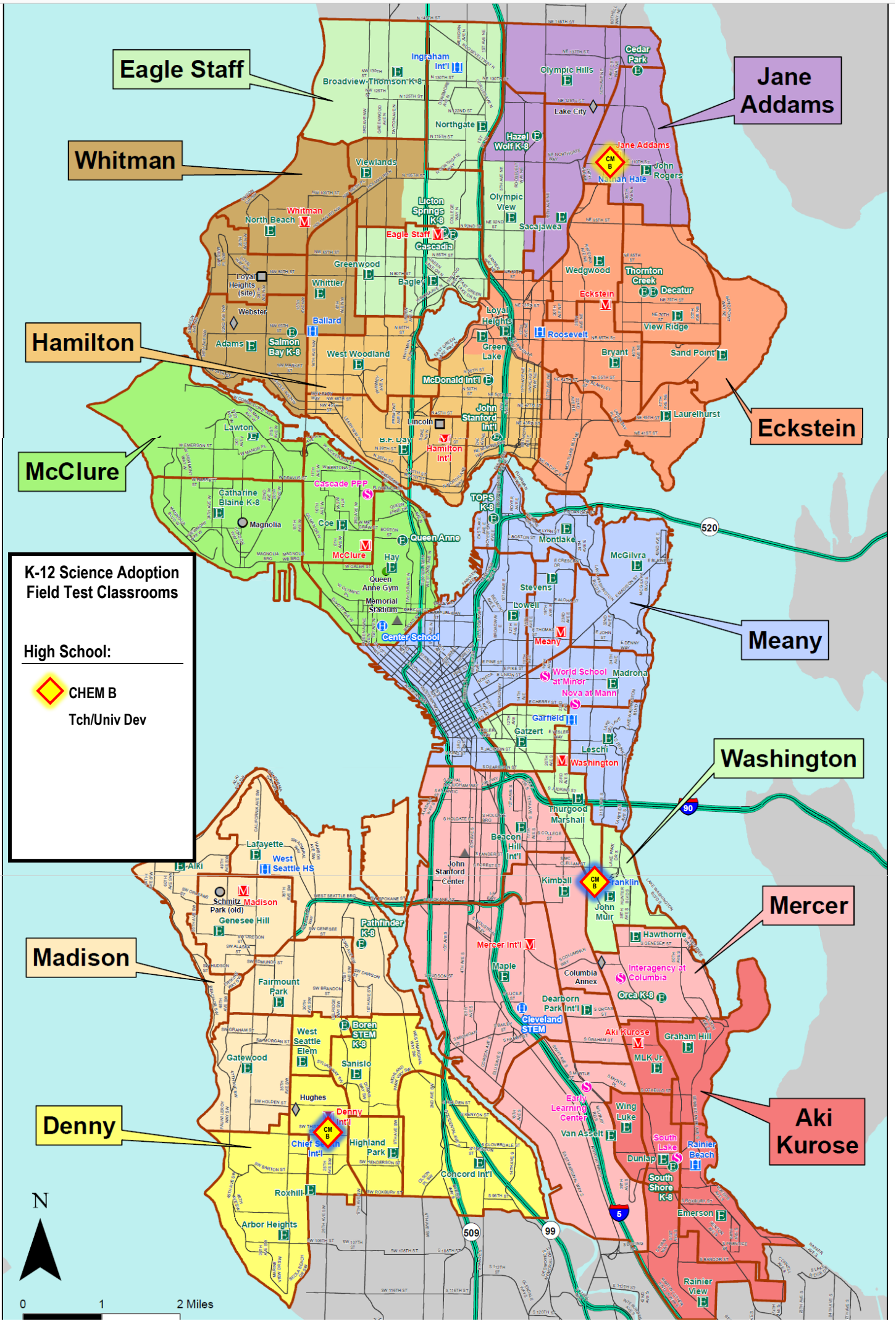
Community members were invited to complete a yes/no survey, containing some of the major criteria within each of the five categories of the Review Criteria. Comments are included below each response.

Do you have children who attend SPS?	8th grader @ Meany MS			
Neighborhood High School?	Garfield HS			
	Yes	**No**	**Blank**	**%**
1: Standards Alignment (8 criteria)	8	0	0	**100%**
2: Assessments (6 criteria)	6	0	0	**100%**
3: Inclusive Educational Practices (6 criteria)	3	3	0	**50%**
4: Evaluation of Bias Content (7 criteria)	1	6	0	**17%**
One "Yes": Materials that equally represent people from all gender identities as central characters				
5: Instructional Planning & Support (10 criteria)	9	1	0	**90%**
One "No": inclusion of global and local perspectives in teacher background materials				
How well do you feel this program meets the high expectations we have set to provide all our students with an equitable, authentic science experience?				Very Well
What did we not ask that you feel is important in the decision-making process? The materials could include more stories/pictures/etc. of different ethnicities and cultures. The reading material should be mandatory for students, not optional. The video/IT resources I viewed were very good.				

Do you have children who attend SPS?	11th grader @ Garfield HS			
Neighborhood High School?	Garfield HS			
	Yes	**No**	**Blank**	**%**
1: Standards Alignment (8 criteria)	7	1	0	**88%**
2: Assessments (6 criteria)	6	0	0	**100%**
3: Inclusive Educational Practices (6 criteria)	3	3	0	**50%**
4: Evaluation of Bias Content (7 criteria)	1	6	0	**17%**
One "Yes": Materials that equally represent people from all gender identities as central characters				
5: Instructional Planning & Support (10 criteria)	9	1	0	**90%**
One "No": inclusion of global and local perspectives in teacher background materials				
How well do you feel this program meets the high expectations we have set to provide all our students with an equitable, authentic science experience?				Well
What did we not ask that you feel is important in the decision-making process? You didn't ask how this compares to other chemistry curricula. I want to say that this is better than anything I've seen with my own HS experience (textbooks) and my neighbors' kid's experiences. They all were more boring and too mathy.				

Attachment G: Field Test Schools and Teachers

School	Demographics	Teacher	Grade / Course
Chief Sealth HS	23.8% White 60.8% Low-income 14.6% EL	Glover	CHEM B
Franklin HS	8.1% White 63.3% Low-income 18.8% EL	Jones	CHEM B
Nathan Hale HS	52.2% White 30.9% Low-income 8.7% EL	Robinson	CHEM B


Eagle Staff
Whitman
Hamilton
McClure
Jane Addams
Eckstein
Meany
Washington
Mercer
Aki Kurose
Denny
Madison
K-12 Science Adoption Field Test Classrooms
High School:
CHEM B
Tch/Univ Dev
Ingraham Int'l
Broadview-Thomson K-8
Olympic Hills
Cedar Park
Lake City
Northgate
Hazel Wolf K-8
Jane Addams
Nathan Hale
John Rogers
Viewlands
Licton Springs K-8
Olympic View
Sacajawea
Whitman
North Beach
Eagle Staff
Cascadia
Greenwood
Bagley
Wedgwood
Thornton Creek
Decatur
Loyal Heights (site)
Whittier
Eckstein
Webster
Ballard
Loyal Heights
Roosevelt
View Ridge
Adams
Salmon Bay K-8
West Woodland
Green Lake
Bryant
Sand Point
McDonald Int'l
John Stanford Int'l
Laurelhurst
Lawton
Lincoln
B.F. Day
Hamilton Int'l
Cascade PPP
Catharine Blaine K-8
Magnolia
Coe
TOPS K-8
Montlake
520
Queen Anne
McClure
Hay
McGilvra
Queen Anne Gym
Memorial Stadium
Stevens
Lowell
Center School
Meany
World School at Minor
Madrona
Nova at Mann
Garfield
Gatzert
Leschi
Washington
Thurgood Marshall
Lafayette
West Seattle HS
Beacon Hill Int'l
Aki
John Stanford Center
Kimball
Franklin
John Muir
Schmitz Park (old)
Madison
Genesee Hill
Pathfinder K-8
Hawthorne
Mercer Int'l
Maple
Columbia Annex
Interagency at Columbia
Fairmount Park
Dearborn Park Int'l
Orca K-8
Cleveland STEM
Boren STEM K-8
West Seattle Elem
Aki Kurose
Graham Hill
Gatewood
Sanislo
MLK Jr.
Early Learning Center
Wing Luke
Hughes
Denny Int'l
Van Asselt
South Lake
Rainier Beach
Highland Park
Dunlap
Concord Int'l
South Shore K-8
Roxhill
Emerson
Arbor Heights
Rainier View
N
0
1
2 Miles

ATTACHMENT H: TABLE OF CONTENTS

Attachment H.1: Field Test Summary Scores

On March 14, 2020, the Adoption Committee worked in small teams to review additional data sources generated from the Field Test stage for evidence of alignment with the Science Instructional Materials Review Criteria, including post-observation teacher interviews, student focus group interviews, end-of-unit student attribute surveys, and student growth data as measured by pre- and post-unit assessments. Combining this new data with their notes from the Field Test teacher panel conducted on the same day, the Committee members collaborated in their teams to collectively synthesize and review all the data for each program to reach consensus on a Field Test score between 0 and 4 in each of the five categories detailed in the Science Instructional Materials Review Criteria (see Attachment D). The score for each category was weighted as previously determined on the Review Criteria, then tallied and reported as a consensus score.

These scores are provided below, along with the original scores from the STEMScopes CHEM B Field Test from 2019 for comparison.

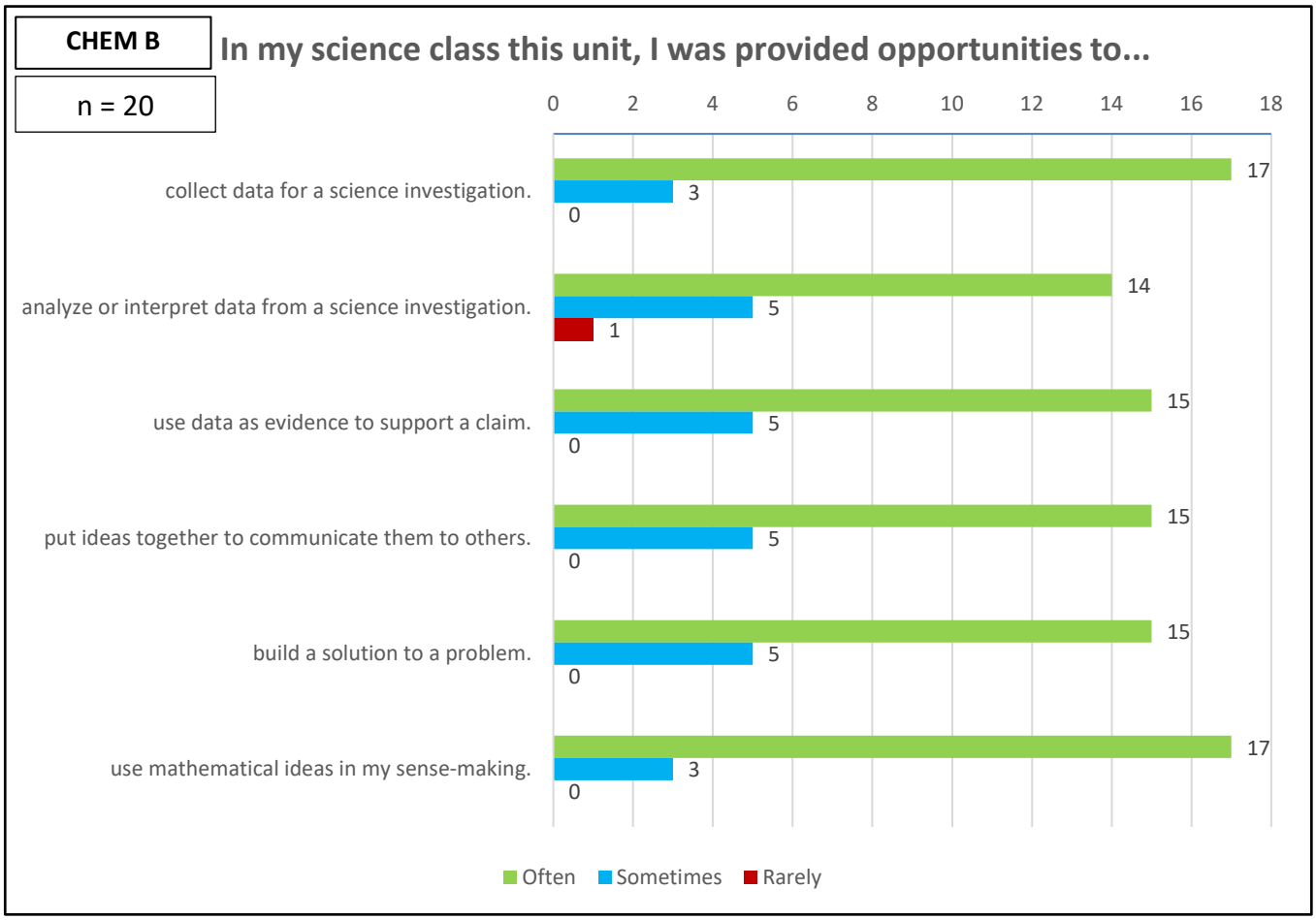
Results: District-Developed Curriculum 2020

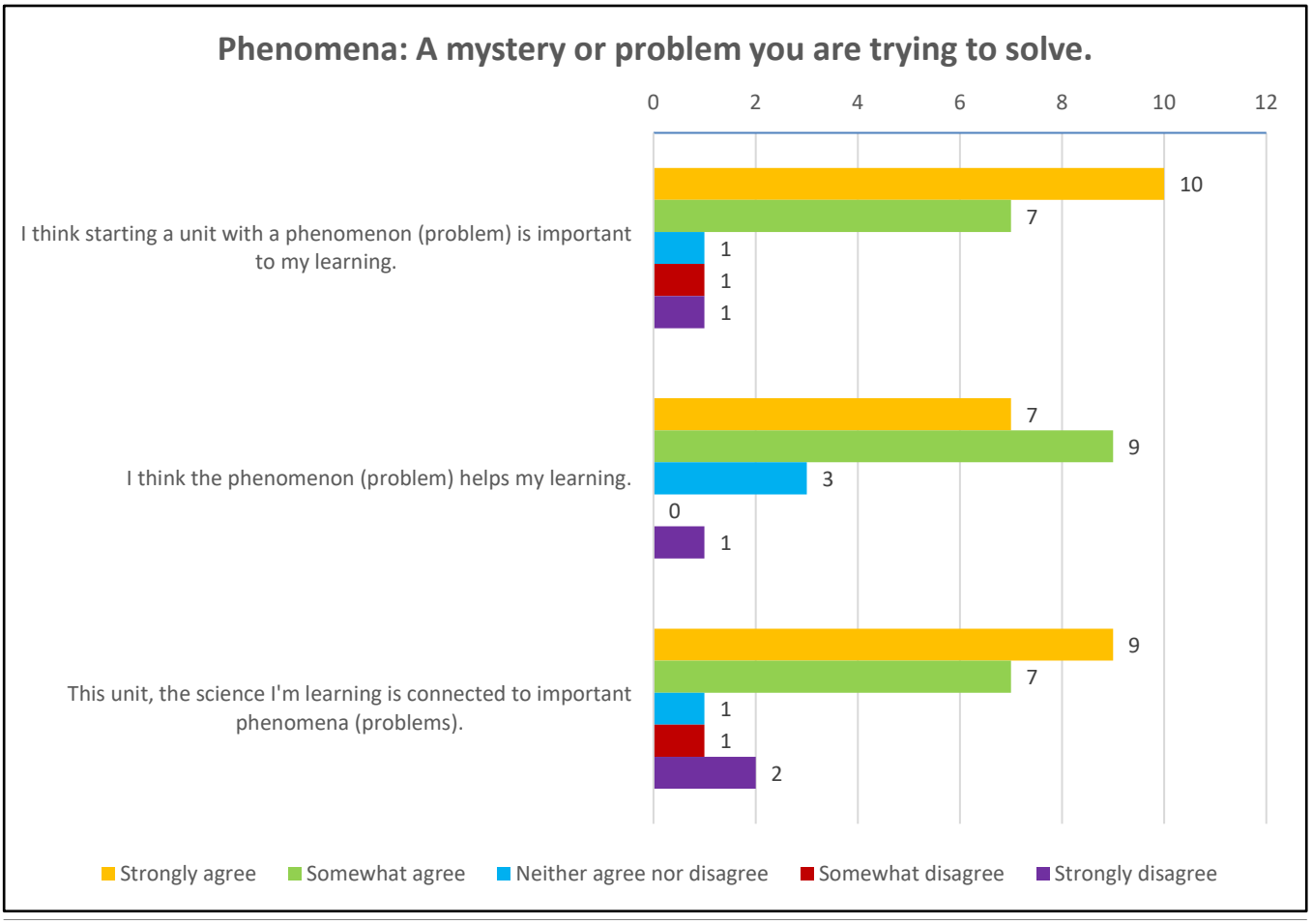
Team	**Consensus Score**
Team A	80.0
Team B	66.0
Team C	89.3
Team D	85.0
Team E	59.3
Average	**79.5**

Results: STEMScopes Field Test 2019

Team	**Consensus Score**
Team A	27.0
Team B	31.5
Team C	18.1
Team D	15.1
Team E	25.5
Team F	21.0
Team G	20.5
Team H	21.0
Average	**22.5**

Attachment H.2

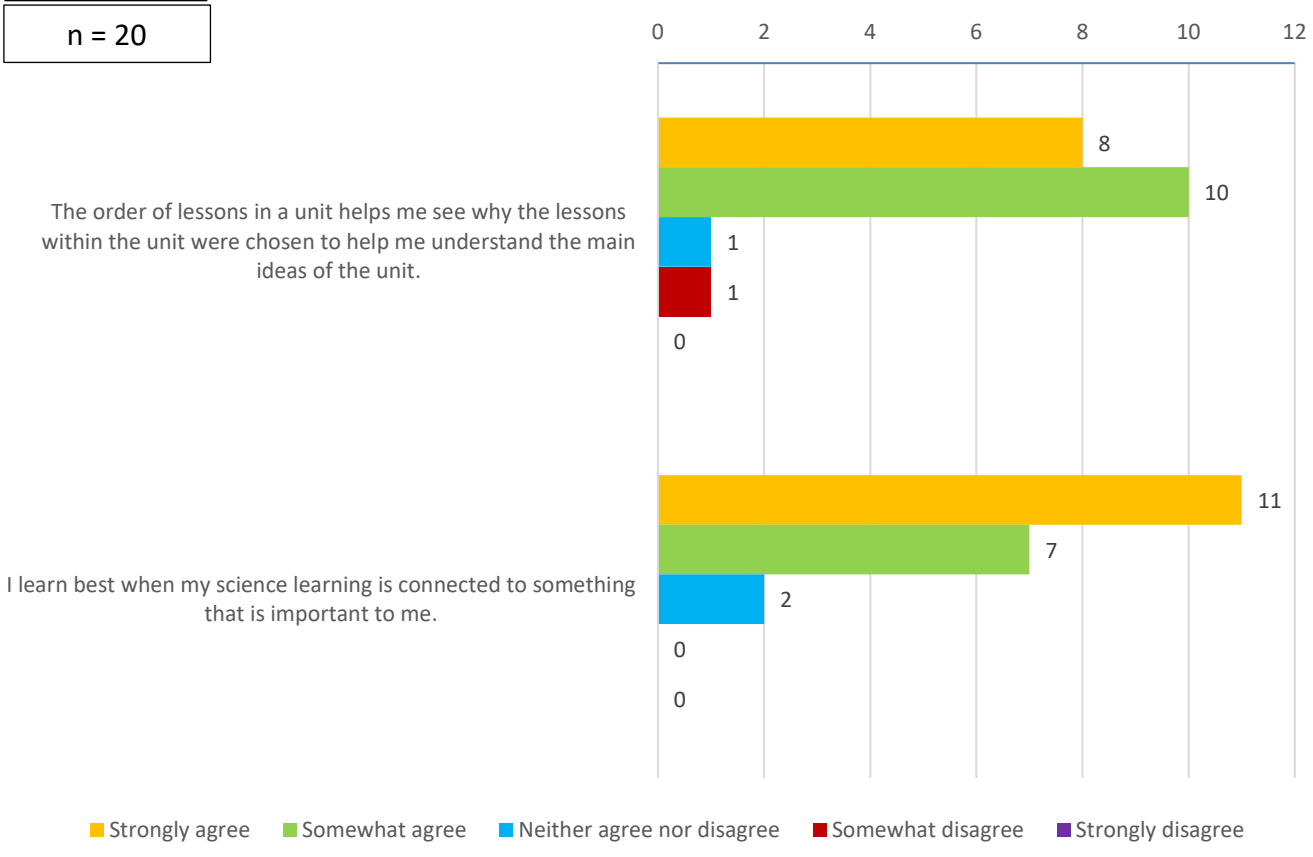




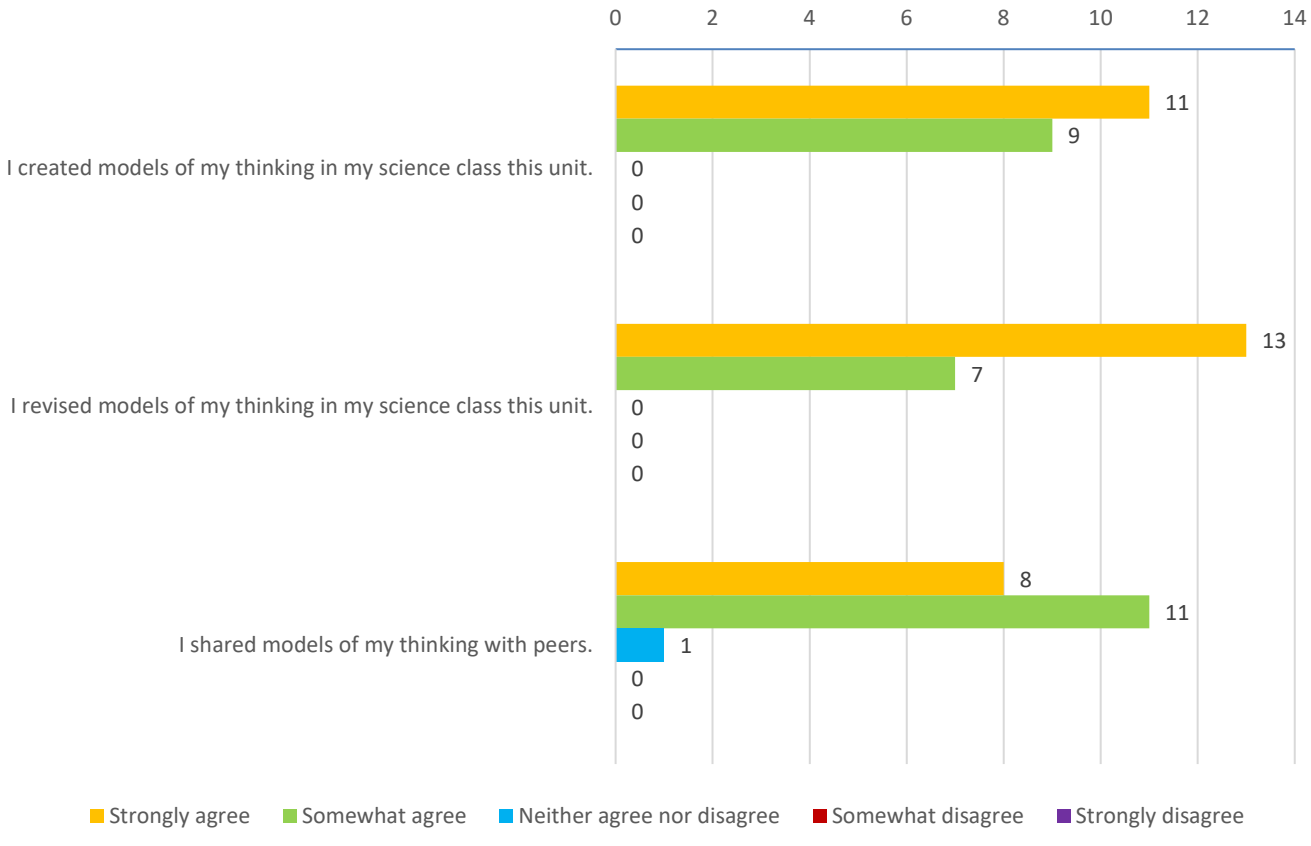
CHEM B

n = 20

Storylining



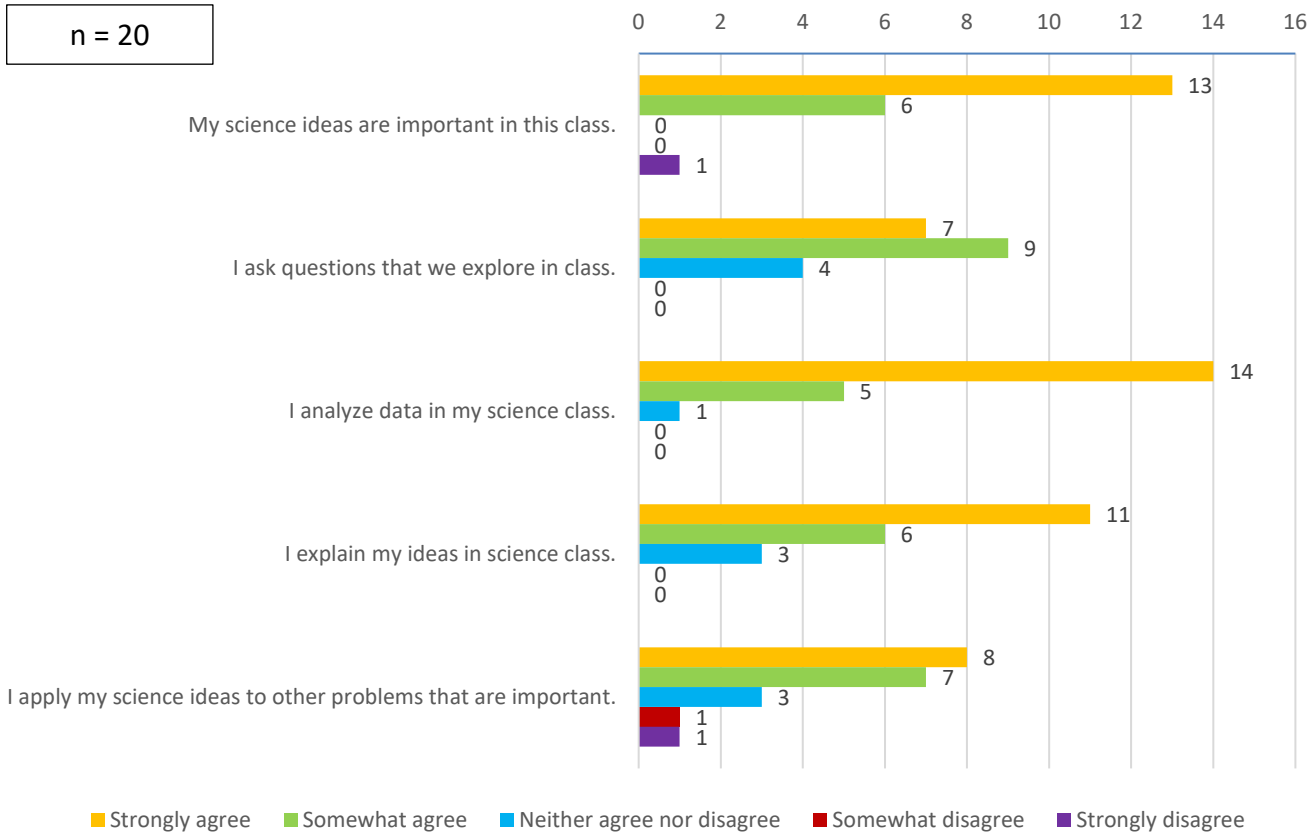
Modeling



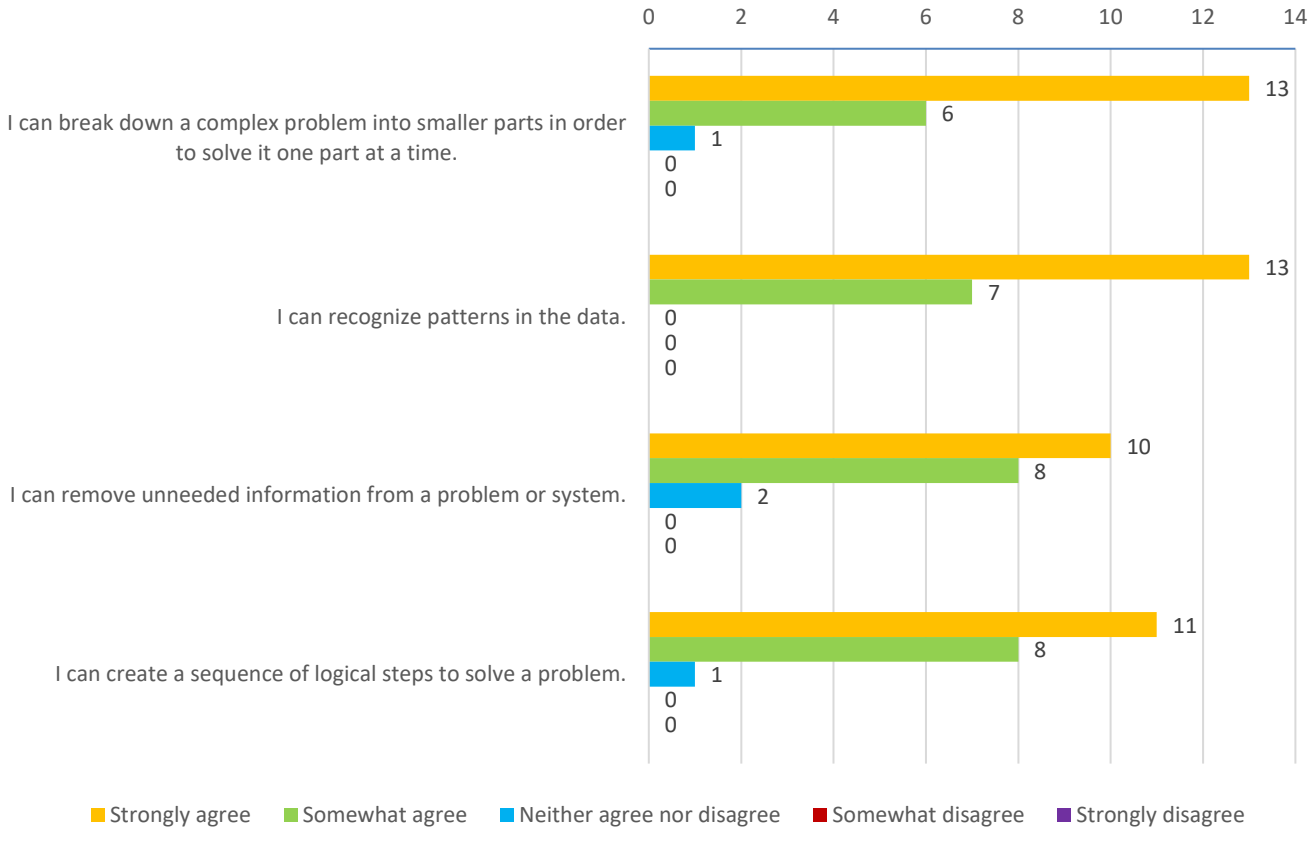
CHEM B

n = 20

Science Ideas & Doing Science



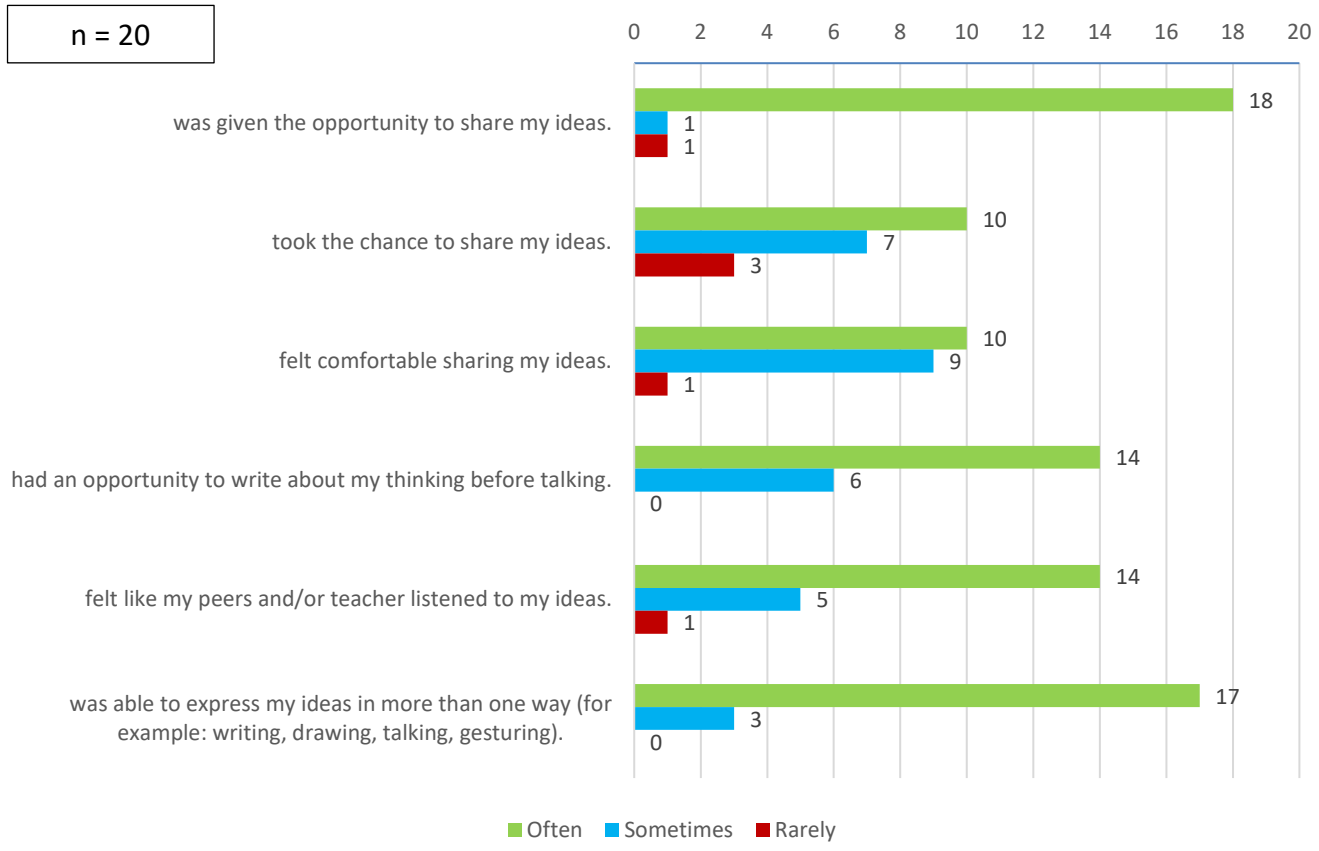
Computational Thinking



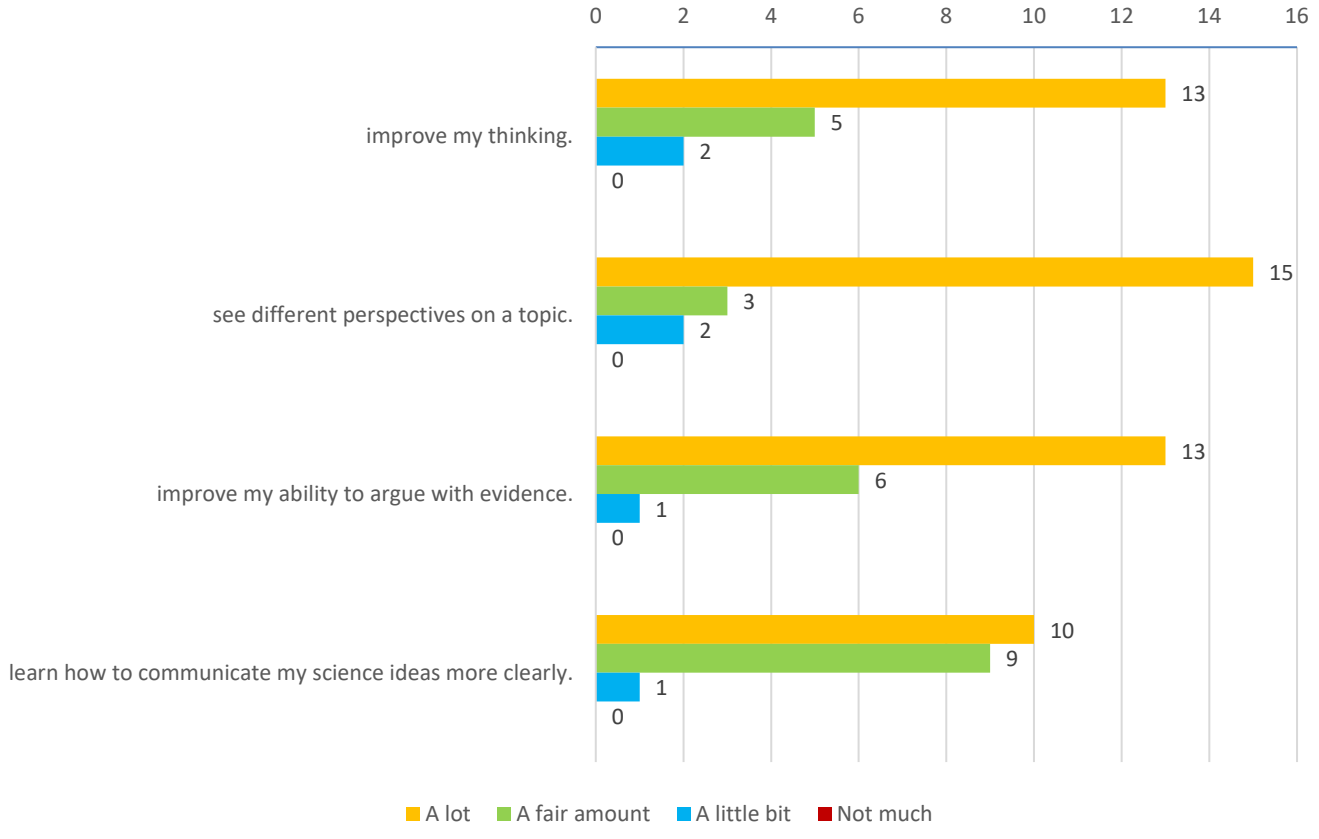
CHEM B

n = 20

In science class this unit, I...

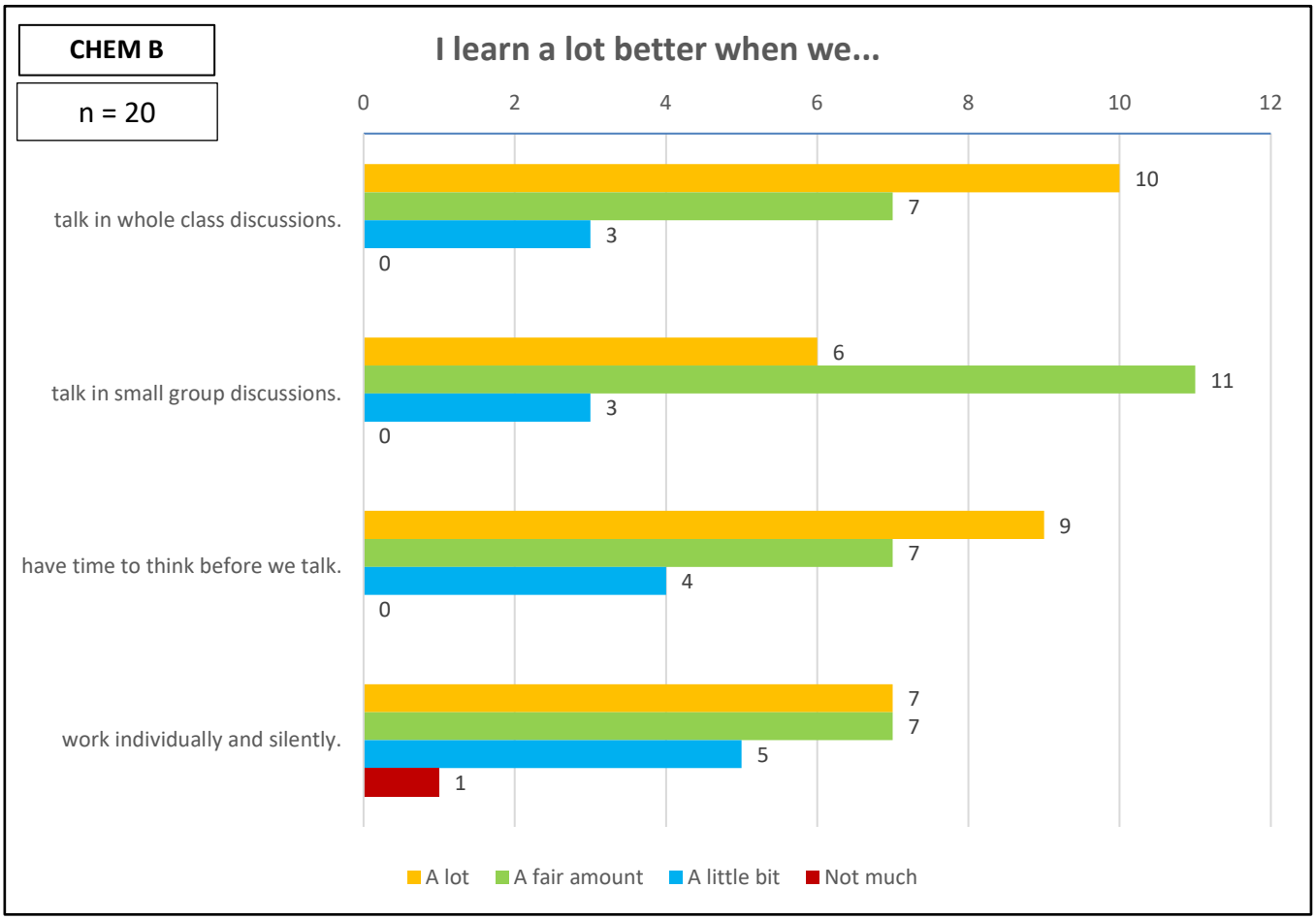


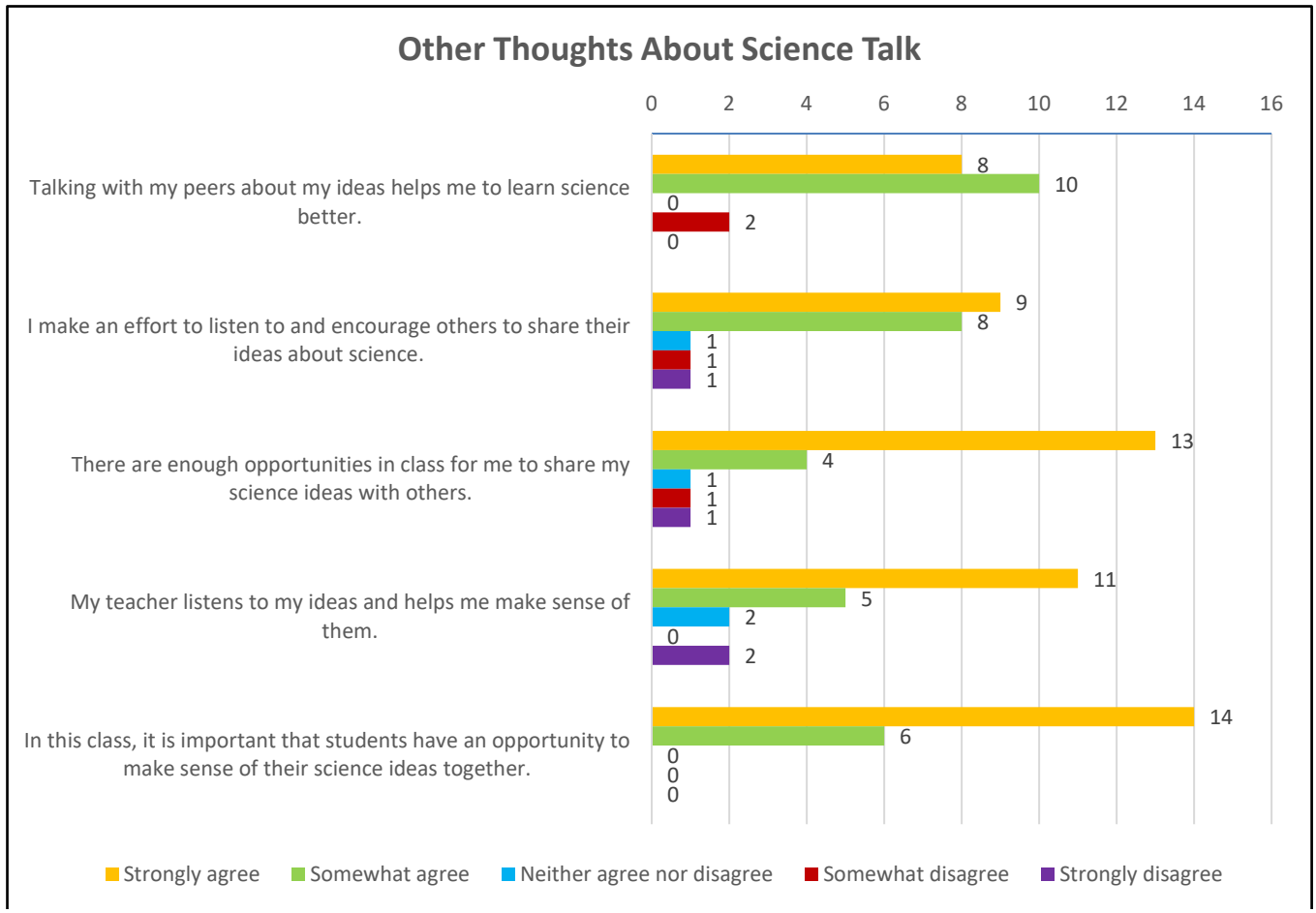
Listening to other students helps me...



CHEM B

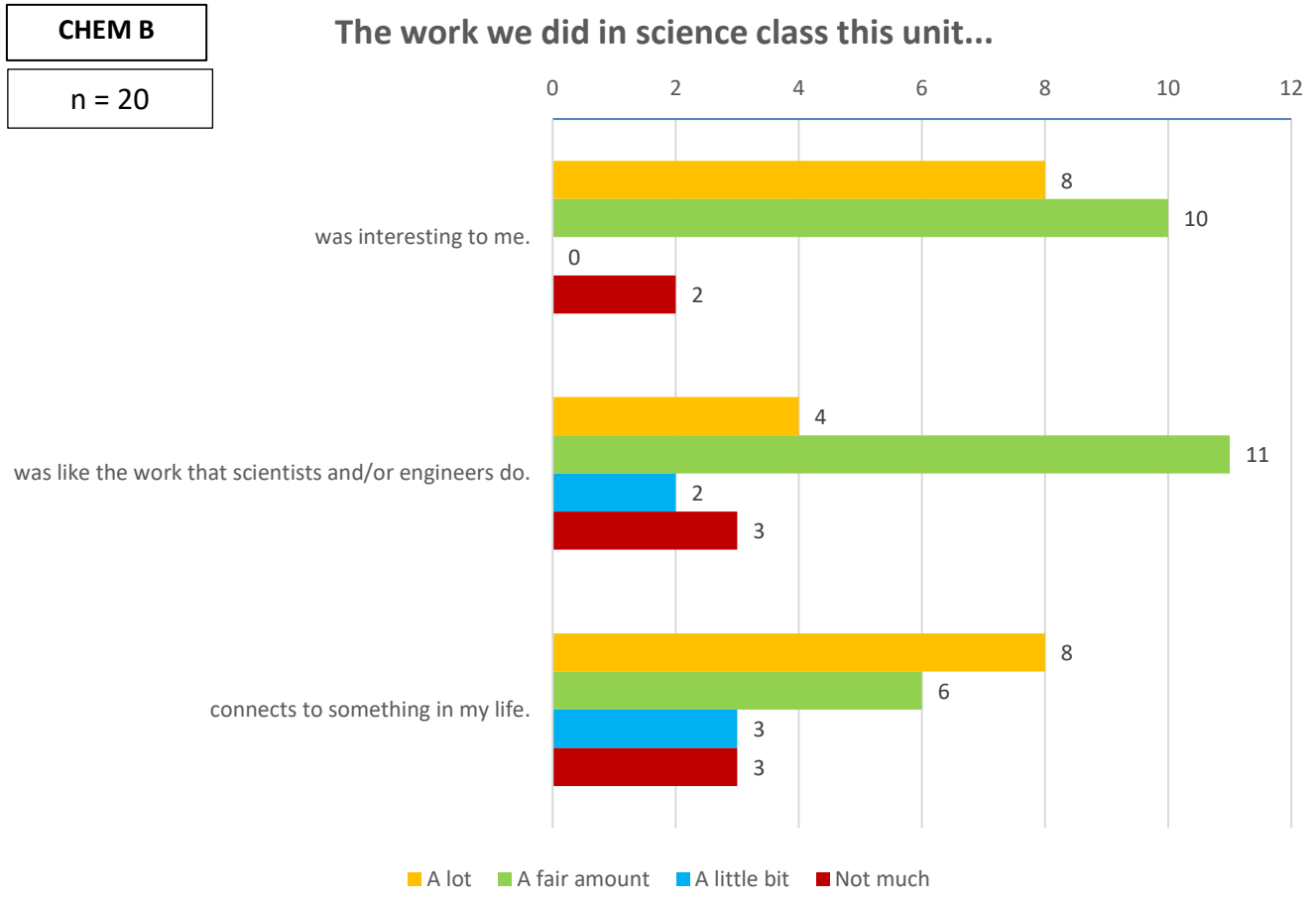
n = 20

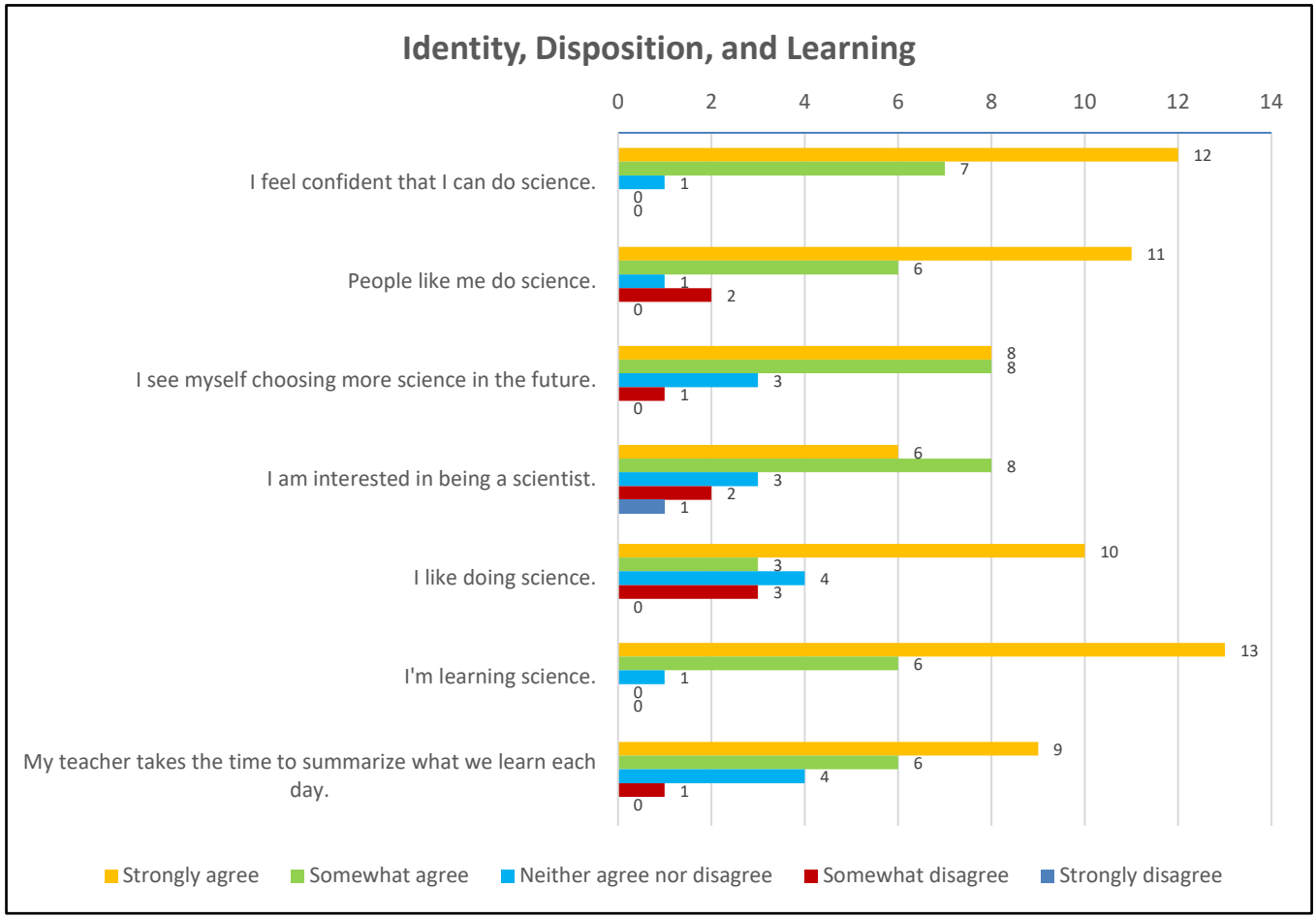

I learn a lot better when we...
0
2
4
6
8
10
12
talk in whole class discussions.
10
7
3
0
talk in small group discussions.
6
11
3
0
have time to think before we talk.
9
7
4
0
work individually and silently.
7
7
5
1
A lot
A fair amount
A little bit
Not much


Other Thoughts About Science Talk
0
2
4
6
8
10
12
14
16
Talking with my peers about my ideas helps me to learn science better.
8
10
0
2
0
I make an effort to listen to and encourage others to share their ideas about science.
9
8
1
1
1
There are enough opportunities in class for me to share my science ideas with others.
13
4
1
1
1
My teacher listens to my ideas and helps me make sense of them.
11
5
2
0
2
In this class, it is important that students have an opportunity to make sense of their science ideas together.
14
6
0
0
0
Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

CHEM B

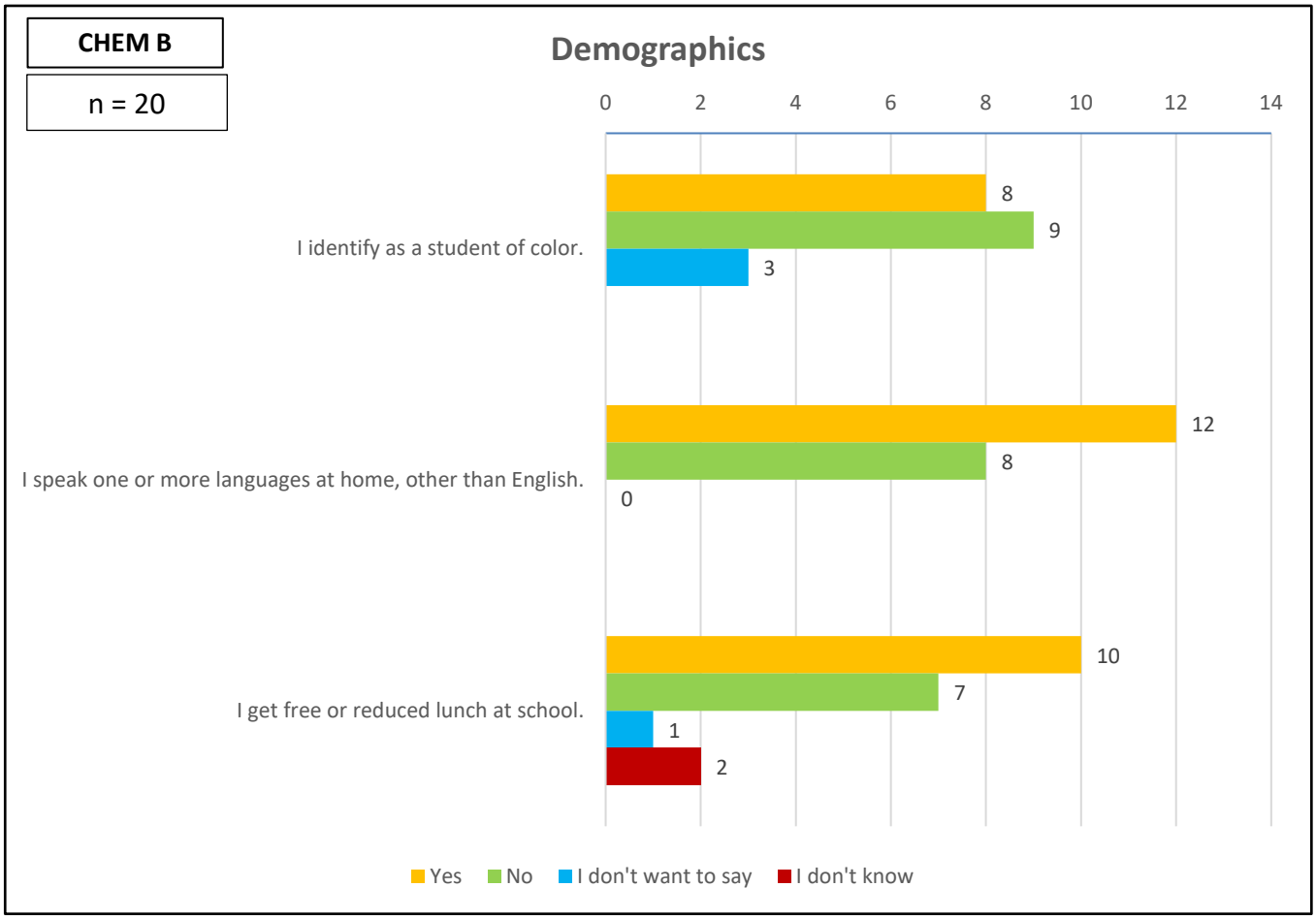
n = 20

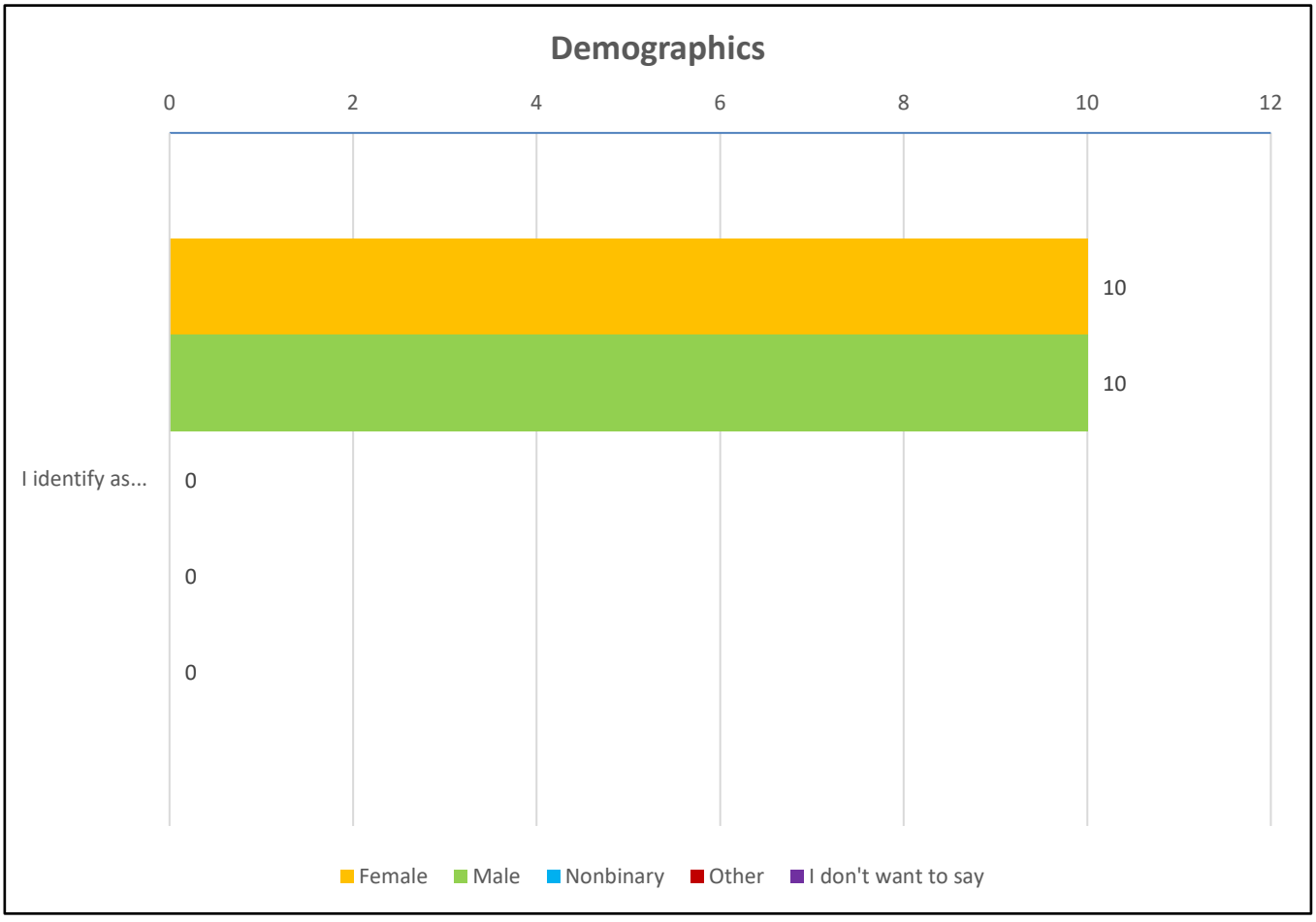

The work we did in science class this unit...
0
2
4
6
8
10
12
was interesting to me.
8
10
0
2
was like the work that scientists and/or engineers do.
4
11
2
3
connects to something in my life.
8
6
3
3
A lot
A fair amount
A little bit
Not much


Identity, Disposition, and Learning
0
2
4
6
8
10
12
14
I feel confident that I can do science.
12
7
1
0
0
People like me do science.
11
6
1
2
0
I see myself choosing more science in the future.
8
8
3
1
0
I am interested in being a scientist.
6
8
3
2
1
I like doing science.
10
3
4
3
0
I'm learning science.
13
6
1
0
0
My teacher takes the time to summarize what we learn each day.
9
6
4
1
0
Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

CHEM B

n = 20


Demographics
0
2
4
6
8
10
12
14
I identify as a student of color.
8
9
3
I speak one or more languages at home, other than English.
12
8
0
I get free or reduced lunch at school.
10
7
1
2
Yes
No
I don't want to say
I don't know


Demographics
0
2
4
6
8
10
12
I identify as...
10
10
0
0
0
Female
Male
Nonbinary
Other
I don't want to say

Attachment H.3: Field Test Data
Student Growth for CHEM B

Field Test teachers collected data from the program's pre-unit and post-unit assessments in order to measure student growth. Results are provided below, along with the results from the STEMScopes CHEM B 2019 Field Test for comparison.

Methodology

Results were converted to a percentage, then an average was generated for both pre-unit (PRE) and post-unit (POST). Only data from students that took both the pre-unit and post-unit assessments was used in the calculation. Average growth was calculated using the following formula: (POST – PRE) / (100% – PRE)

Results: District-Developed Curriculum Field Test 2020

Program	# of Classrooms	Pre-Unit Average (%)	Post-Unit Average (%)	Average Student Growth (%)
District-Developed Curriculum (CHEM B)	2	28.7%	74.8%	**64.6%**

Results: STEMScopes 2019 Field Test

Program	# of Classrooms	Pre-Unit Average (%)	Post-Unit Average (%)	Average Student Growth (%)
STEMScopes (CHEM B)	2	22.3%	23.0%	**0.9%**

Attachment H.4

Summary of Evidence Gathered During Teacher Observation and Interview
Unit: The Mole

4: Superior Evidence 3: Strong Evidence 2: Moderate Evidence 1: Minimal Evidence 0: No Evidence

Characteristic	Teacher 1	Teacher 2
SEP attended to within the unit	4	4
Phenomenon		
• Presence of	4	4
• Revisiting	3	4
• Engaging	3	3
Evidence Gathered		
• Multiple Types	4	4
• Student engagement	2	3
Student Discourse for sense-making	3	3
Students tracking their progress (self-assessment)	4	4
Student Explanations	2	2
Usefulness of Materials	4	4

<u>Excerpts from Student Interviews:</u>

Classroom 1:

- *Student discourse for sensemaking:* "Sometimes your classmates can understand things and explain them in a different way than the teacher can … I can turn to my friend at the table and … she can tell me what she knows, and I can tell her what I know, and then we know more."
- *Students tracking their progress using a tool:* "It has boxes you can put what you did each day and you can both write and draw on it … I like it a lot better because I know exactly what I need to write and then I can look it over before a test … it helps me focus on what is important and what the big ideas are."
- *Exit tickets:* "Those help me a lot! If I can't do the exit ticket, I know that I need more help on the thing we learned that day. And if I got it right, I can feel confident I understand the idea."

Classroom 2:

- *Phenomenon- and storyline-based learning:* "I feel like having a phenomenon… I mean, we started the unit by eating hot peppers. It's so much easier to learn concepts when you have examples, and you can actually experience it, even better. Because if [the teacher] had been like, 'this is why peppers are spicy, here, read this article,' it wouldn't have made sense, or wouldn't have been memorable. It also sparks a lot more interest."
- *Hands-on activities:* "It's so much better when we learn that way. I feel like in the past, with all the examples and the readings, it so vague, so plain, that when you think about what you've learned, you

don't remember much of it, but with this, the experience is so memorable and specific, it's specific to the subject, that when you think about it – "oh, I did this bubblegum thing, and it was changing like this, and the sugar –" Like, you remember what you learned. You *feel* it."

- *Gathering evidence:* "We have this overarching question for the unit, which is usually based around the first thing we do – like, 'why are peppers spicy?' then for each lab or activity we do, we look at how they connect back to that overall question. So you fill out [the learning tracking tool], after each lab you fill out one section. Which in some ways is easier, you can see how [the evidence] connects, and you can prepare for the test."

- *Effectiveness of Materials:* "When you first hear about this type of learning, you might think, oh, yeah, it's good for certain types of learners, like visual learners. But because there are so many aspects to what we do – you get some worksheets, you get some hands-on, it's all very practical and real world, we do watch videos occasionally and yes she does talk to us occasionally – but I think because of that, it really does work for everyone. And I think that's a really hard thing to accomplish."

  "I have always kind of struggled with the fact that school was a lot more memorization than learning for me. And that always really bugged me. I would take a test, and then I would forget about all the stuff. But I feel like this is a little more – almost like how a language arts class would be taught. But a science course instead, if that makes sense. There is a lot more, 'how do we think critically about this?' and 'how do we work through this?' which I think is more helpful to my learning."

Attachment H.5: Field Test Teacher Panel Transcript

Panel: Teachers JG, TR, and YJ

Standards:
Was it apparent to you which Disciplinary Core Ideas were addressed in this unit? Did you feel this unit provides opportunities for students develop and build on these core ideas?

JG: Yes, all were posted on the Schoology page [online teacher guide] of each lesson. And almost every lesson contains hands-on and/or model-building activities.

TR: Yes. Very clear which DCI were being addressed fro each unit and in which particular lessons. The unit tested with my students, was great on building on the concept of the mole in manageable steps.

YJ: Yes, they're listed and activities clearly align.

Practices:
Was it apparent to you which Science and Engineering Practices were practiced in this unit? Did students actually engage in those practices? Can you provide examples?

JG: Yes, all were posted on the Schoology page of each lesson. Yes, many units incorporate engineering/problem solving practices, and/or projects.

TR: There were SEPs addressed, specifically mathematical and computational thinking. The entire unit centered around the SEP as students learned about the concept of the mole and how it is used in chemistry.

YJ: Yes, mathematical and computational thinking is a core part of this unit. In fact I would say the practice in this unit is stronger than the DCI (as intended).

Cross Cutting Concepts:
Was it apparent to you which CCC's were the focus of this unit? Please explain how students used the CCC's in this unit.

JG: Yes, students use cause and effect when tasting peppers, and the entire unit is centered around scale, proportion and quantity.

TR: Yes, the CCCs were apparent, specifically scale, proportion and quantity. As students learned about the mole and why and how it is used they were engaged in thinking about scale of particles and why the mole is used in chemistry.

YJ: Less so than SEP or DCIs, but it's clear as you're moving through the lessons that scale is a major focus.

Phenomenon and Modeling:
Was there an anchoring phenomenon for this unit? What was it? Did students find this phenomenon engaging? Did students draw an initial model to show their ideas about the phenomenon at the beginning of the unit? Were their opportunities to revisit this phenomenon and revisit the model? Did these opportunities help deepen student understanding of the phenomenon?

JG: Yes, the phenomenon is to explain why peppers have different levels of 'hottness'. And yes, there were opportunities to help deepen student understanding, but this skill requires practice for teachers to master.

TR: Yes. What makes peppers spicy? They really enjoyed the unit as we started with tasting different varieties of peppers then drawing a model to show why differences in spiciness. Through the unit students deepened their understanding of using the language of chemistry to discuss, compare and measure spiciness.

YJ: How do we model what makes different peppers different levels of spice? Students had fun during this phenomenon and created an initial model in 3 ways: written, visual, and mathematical. The unit is very short, so there was not a time that made sense to revisit before the end, but at the end there was a thoughtful discourse strategy for revising and finalizing.

Did the lessons sequence within the unit coherently string together to build a storyline that helped students collect evidence to explain the phenomenon/driving question?

JG: Yes. Each lesson builds sequentially on the previous lesson. Each lesson also spells out for the teacher what the learning targets are and how it helps to build the model.

TR: Yes. It made sense students added to their mathematical and conceptual understanding of the mole as it related to chemistry and why differences in spice levels.

YJ: Yes.

Assessments:
Were the assessments provided 3- or 2-dimensional?

JG: Most are 2-D, but there are some 3-D options.

TR: Yes. As the unit addressed the DCI, SEP, and CCC that was brought through with the assessment questions.

YJ: The pre/post tests had a few questions you could say are 2-dimensional, but the test bank had questions that asked students to consider content, practice, and overarching content (remember my earlier note that DCIs are not fully addressed within this unit intentionally).

Were the questions accessible to all learners?

JG: Yes, but the bar can still feel very difficult for students who struggle with math or have IEPs.

TR: I think so. I rarely had to clarify questions for students.

YJ: Yes.

Were formative assessments embedded throughout the unit and did they offer information to both the teacher and students about the student learning progress throughout the unit? Did the assessments provide you with information that you were able to use in planning and modifying instruction?

JG: Yes, formative assessments in the form of exit tickets are present for many/most lessons. They help teachers, but the modifications that may be required are not always present.

TR: There were formative assessments to help me know what students understood.

YJ: Yes exit tickets and practice were good for diagnosing.

Were the suggestions for supporting student understanding helpful?

TR: There were suggested resources that could be given to students if they were struggling.

Were Summative assessments fair and did they accurately measure student learning of the intended standards?

JG and TR: Yes.

YJ: I think the test bank gives enough breadth and depth for this, so yes.

Were tools provided for you to be able to score assessments and provide feedback to students?

JG and TR: Yes.

YJ: Yes. Performance Matters, your own assessments had to be done the "old fashioned way."

Were there options to conduct the assessments on a digital platform, and were those options practical?

JG: Yes, on Performance Matters. Otherwise, teachers are left to transfer exit tickets and assessments into the Schoology platform.

TR: Yes.

YJ: Yes, relatively so. We're still working out the Performance Matters administration.

Inclusive Educational Practices:

Did the instructional materials leverage student's prior knowledge, are culturally inclusive and are interesting to your students? Please cite examples.

JG: Yes. To the extent this is possible in chemistry, this unit does this. Almost all student have some experience eating spicy food. It transcends cultures.

TR: Yes – when engaging in initial ideas, students were able to talk about the experiences with peppers.

YJ: Yes, food!

Did the instructional materials provide a balance of activities (simulations, hands-on, readings, discussions) to offer students the evidence needed for sense-making of the content and phenomenon? Please give us an overview.

JG: There is a good balance of activities in this unit. There are hands on activities (1-1, 1-4), readings (1-2), calculations (1-3), and multiple opportunities to discuss the phenomenon throughout.

TR: Yes – hands-on, reading, lots of discussion opportunities.

YJ: Yes, no simulations, but everything else.

Did the instructional materials offer opportunities for students to explore, or learn about, career opportunities in this area?

JG: No. Unless professional eater is a viable opportunity.

TR and YJ: No.

Did the instructional materials offered cultural perspectives showing work of scientists from different ethnic backgrounds and sharing how different communities are impacted by science?

JG: The pepper unit allowed for students to recognize the commonality of pepper use in cuisine throughout the world.

TR: No.

YJ: Not really.

Did the curriculum provide options for differentiation to address students at various skill levels? Please share an example of said modifications.

JG: There are limited examples of places modifications are addressed. However, there are multiple methods for modifying the mole calculations and molarity calculations.

TR: Sort of. There were practice problems that could be given at different levels.

YJ: No.

Evaluation of Bias Content:
Did you see any evidence of bias content from the perspective of ethnicity; culture; gender, physical disability; physical characteristics; age; family structure; socioeconomic status; geographic setting?

All: No.

Teacher Planning, Usability, and Support:
Was the unit constructed in a way that helps a teacher enact 3-dimensional teaching?

JG: Yes. Even though there are few opportunities for 'engineering' practices all three pillars of learning are addressed.

TR: Yes, though not explicitly called out all the time, the 3 dimensions were seamlessly integrated, and that made it easy to teach using all 3 dimensions.

YJ: Yes – phenomenon based, discovery based, practices and concepts woven throughout.

Did the instructional materials guide teachers on how to engage students in the phenomenon, collect evidence to explain the phenomenon, revise their models and develop a scientifically accurate explanation about the phenomenon?

JG: Yes. The supporting teaching documents were sufficient to engage students in model building and revision.

TR: Yes. Clear lesson plans that had teacher notes, what students might say, and additional resources.

YJ: Yes.

Did the instructional materials identify opportunities for students to engage in discourse and sense-making throughout the unit? How often? Were discourse strategies and norms embedded and offered as examples?

JG: Each lesson had opportunities called out for discourse strategies to be used where appropriate.

TR: Yes, 3 out of 5 lessons. There were specific discourse strategies and lessons to help guide teachers.

YJ: There is guidance for discourse with nearly every lesson.

Does the instructional program contain teacher guidance, with annotations and suggestions, for how to successfully implement their units and daily lesson plans, including common issues that arise and how to respond to them?

JG: Yes. Each lesson that lasts longer than one day spells out what should be carried out each day and the approximate amount of time it should take. At the end of each

lesson there are sections that spell out what students should be able to explain by the time they get to that point of the unit.

TR: Yes. Each lesson had a basic summary of what students will learn and do, how long it should take, list of materials, instructions on how to carry out the lesson, teacher notes, and additional resources.

YJ: Yes to implementation in the instructions and teacher notes sections, but it does not provide a ton of guidance for responding to common issues.

Do the teacher support materials provide background knowledge related to the scientific content?

JG: Some background knowledge and scientific content is included in this unit.

TR: Yes.

YJ: There is some, and the readings that are provided to distribute to students are very helpful.

Attachment I: Analysis and Synthesis Summary of Feedback and Data for CHEM B

A. Review Criteria Tool (Attachment D)

Category	Weighting	Team A	Team B	Team C	Team D	Team E	Avg.
Category 1: Standards Alignment	0.24	77.4	76.0	76.4	72.1	62.2	**72.8**
Category 2: Assessments	0.20	69.2	61.5	98.1	55.8	40.4	**65.0**
Category 3: Inclusive Educational Practices	0.17	34.6	32.7	44.2	36.5	19.2	**33.4**
Category 4: Evaluation of Bias Content	0.16	2.5	5.0	10.0	10.0	0.0	**5.5**
Category 5: Instructional Planning and Support	0.23	58.0	46.5	63.9	54.5	26.7	**49.9**
Total, based on weighting		52.0	47.6	61.8	48.8	32.4	**48.5**

B. Field Test Data Collection found in Attachment H
C. Summary of Community and Family Input and Feedback found in Attachment F
D. Analysis based on:
    a. Review Criteria (above)
    b. Consensus Scores for Field Test Components in Attachment H
    c. Summary of Community and Family Input and Feedback

Summary Posters of this analysis are below.

The average summary score for STEMScopes in 2019 is provided for comparison.

Team	Teacher-Developed CHEM B
Team A	68.5
Team B	58.6
Team C	79.7
Team D	67.9
Team E	48.3
AVERAGE	**64.6**
AVERAGE of STEMScopes (2019)	*25.7*

CHEM B Teacher-Developed	Team A		Score 68.5
	Consensus Score	Weight	Score x Weight
Review Criteria Score	52.0	44.0%	22.9
Field Test Data	80.0	48.0%	38.4
Public Feedback	90.0	8.0%	7.2

CHEM B Teacher-Developed	Team B		Score 58.6
	Consensus Score	Weight	Score x Weight
Review Criteria Score	47.6	44.0%	20.9
Field Test Data	66.0	48.0%	31.7
Public Feedback	74.4	8.0%	6.0

CHEM B Teacher-Developed	Team C		Score 79.7
	Consensus Score	Weight	Score x Weight
Review Criteria Score	68.2	44.0%	30.0
Field Test Data	89.3	48.0%	42.9
Public Feedback	85.3	8.0%	6.8

CHEM B Teacher-Developed	Team D		Score 67.9
	Consensus Score	**Weight**	**Score x Weight**
Review Criteria Score	**48.8**	**44.0%**	**21.5**
Field Test Data	**85.0**	**48.0%**	**40.8**
Public Feedback	**70.0**	**8.0%**	**5.6**

CHEM B Teacher-Developed	Team E		Score 48.3
	Consensus Score	**Weight**	**Score x Weight**
Review Criteria Score	**32.4**	**44.0%**	**14.3**
Field Test Data	**59.3**	**48.0%**	**28.5**
Public Feedback	**70.2**	**8.0%**	**5.6**

Attachment J

Racial Equity Analysis Tool

It is the moral and ethical responsibility and a top priority for Seattle Public Schools to provide Equity Access and Opportunity for every student, and to eliminate racial inequity in our educational and administrative system.

Research indicates that racial disparities exist in virtually every key indicator of child, family, and community well-being. Individual, institutional and structural impacts of race and racism are pervasive and significantly affect key life indicators of success. The **Racial Equity Analysis Tool** lays out a clear process and a set of questions to guide the development, implementation and evaluation of significant policies, initiatives, professional development, programs, instructional practices and budget issues to address the impacts on racial equity. To do this requires ending **individual racism**, **institutional racism** and **structural racism**.

The concept of **racial equity** goes beyond formal racial equality — where all students are treated the same — to fostering a barrier-free environment where all students, regardless of their race have the opportunity to achieve. This means differentiating resource allocations, within budgetary limitations, to serve students with the support and opportunities **they need** to succeed academically.

Why and when should I use it?

- ***Use*** this tool to create an equity lens for educational leaders:

  The Racial Equity Analysis Toolkit provides a set of guiding questions to determine if existing and proposed policies, budgetary decisions, programs, professional development and instructional practices are likely to close the opportunity gap for specific racial groups in Seattle Public Schools.
- ***Apply*** the tool to decrease the opportunity gap, and increase positive outcomes for students of color.

Department/Region/School: **Science/All District/K-12 Schools**

Facilitator: **MaryMargaret Welch** Date: **April 2015 - Present**

Committee/Community members: **MaryMargaret Welch, Alisha Taylor, Brad Shigenaka, Christine Benita, Christine Boyll, K-8 Adoption Committee members, and future 9-12 Adoption Committee membership, which will be finalized by October 15, 2018.**

Decision/Policy: **K-12 Science Instructional Materials Adoption**

Making a new decision? **Yes, the Committee will recommend instructional materials for adoption.**

Expected Outcomes: **Equitable access for all students to current, high quality, standards-aligned science instructional materials.**

Have you had any Equity Training from SPS? **SPS Race & Equity Team training series**

How many times have you used the Analysis Tool? **Science Alignment Team work 2016-17**

Please mark the type of decision below:

Applicable Policy: No	Procedure: No
Program: Yes	Budget Issue: No
Professional Development: No	Hiring and Staffing: No

Racial Equity Analysis Tool

Glossary:

Race: Race is a powerful social idea that gives people different access to opportunities and resources. Race is not biological but is real. Race affects everyone, whether we are aware of it or not.

Individual racism: Pre-judgment, bias, stereotypes about an individual or group based on race. The impacts of racism on individuals include members of certain racial groups internalizing privilege and people of color internalizing oppression.

Institutional racism: When organizational programs or policies work to the benefit of certain racial groups and to the detriment of people of color, usually unintentionally or inadvertently.

Structural racism: The interplay of policies, practices, and programs of multiple institutions which leads to adverse outcomes and conditions for people of color compared to members of other racial groups. This occurs within the context of racialized historical and cultural conditions.

Accountable: Responsive to the needs and concerns of those most impacted by the issues you are working on, particularly to communities of color and those historically underrepresented in the civic process.

Educational and Racial Equity: Providing equitable access to opportunities, resources and support for each and every child by intentionally recognizing and eliminating historical barriers, as well as the predictability of personal and academic success based on race, background and/or circumstance.

Racial Inequity: When communities of color do not have access to opportunities and a person's race can predict their social, economic and political opportunities and outcomes.

Stakeholders: Those student, families and community groups impacted by proposed policy, program or budget issue who have potential concerns or issue expertise. Examples might include: specific racial/ ethnic groups, other institutions like Seattle Housing Authority, schools, community-based organizations, staff and families.

Culture: The ways that we each live our lives; including values, language, customs, behaviors, expectations, ideals governing childrearing, the nature of friendship, patterns of handling emotions, social interaction rate, notions of leadership, etc.

Expected Outcomes: A measurable result that is planned for, using the racial equity tool.

SEATTLE PUBLIC SCHOOLS

Racial Equity Analysis Tool

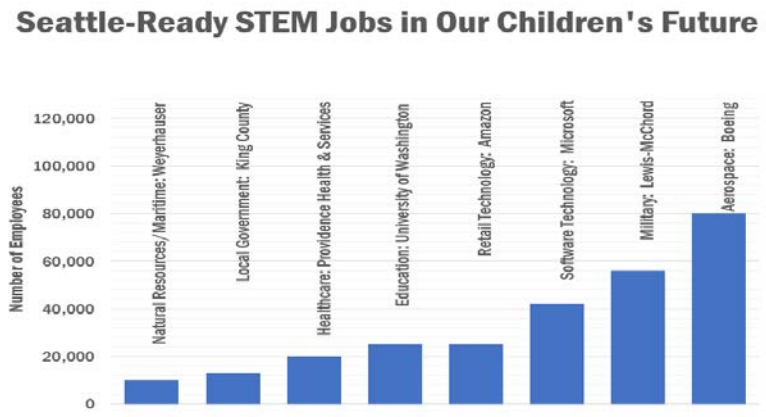
STEP 1: Set Outcomes, Identify and Engage Stakeholders
Leadership sets key racially equitable outcomes and engages stakeholders (SPS staff and community members.)

1. What does your department/division/school define as racially equitable outcomes related to this issue?

Seattle Public Schools Science Departments has used this tool to ensure that the Science Materials Adoption Committee members represent Seattle's diverse population. This tool was also used to ensure the Adoption Committee evaluates materials using a racial equity lens. Our goal is to improve accessibility for all students to culturally relevant, rigorous science learning called for by Next Generation Science Standards which the state adopted in 2013, known as the Washington State Science Learning Standards, WSSLS, in order to eliminate the opportunity gap for students of color in regards to STEM careers so that our students are college and career ready.

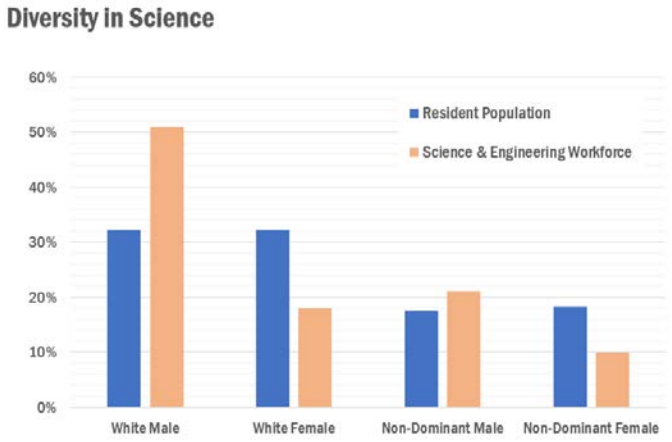
The WSSLS calls for students to learn science and engineering practices through engaging, culturally relevant content. We have defined racially equitable outcomes for students of color, English language learners, and students with special needs as the increased participation and success in science of these students. Historically, K-12 science has focused on direct instruction, observation and an overemphasis on the scientific method, making it difficult for many learners to access the content. In fact, nationally, we have a crisis in equity in STEM fields, and in our state of Washington there is great disparity between the concentration of STEM-related jobs and a prepared labor pool. The data below quantifies the manifestation of the opportunity gap for students of color locally and nationally at both K-12 and in the workforce:

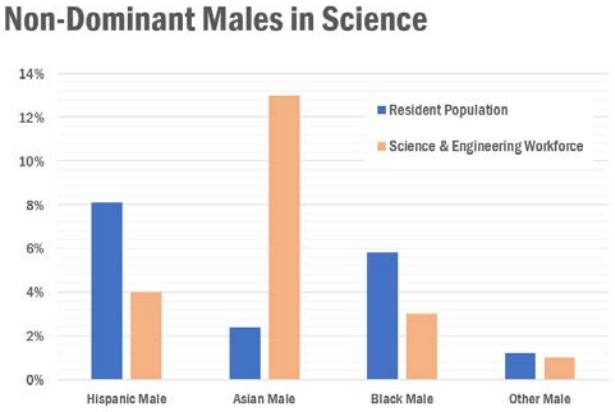
- Washington 4th grade African American and Hispanic students, respectively, score 31 and 29 points lower on the National Assessment of Educational Progress in Science. (*2015 National Assessment of Educational Progress (NEAP) Nation's Report Card - http://nces. ed.gov/nationsreportcard/states/*.)
- Washington's achievement gaps in math and science have not improved in over a decade and are the 12th largest in the nation. If we continue to address the achievement gap at this current glacial rate, it would take 150 years for our African American students to realize the same level of achievement as their peers. (*Center for Education Policy, The Achievement Gap: Slow and Uneven Progress for Students, 2010*.)

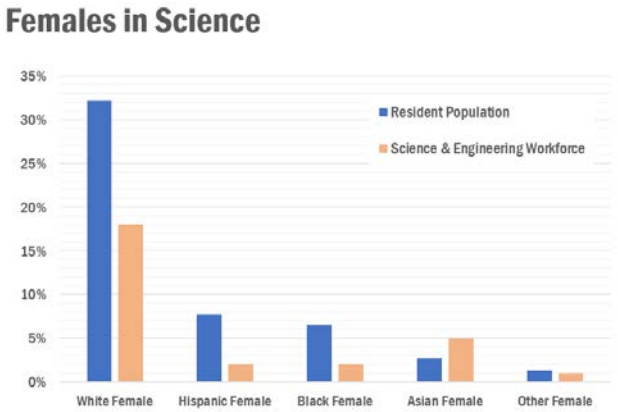


Source: Washington STEM, www.washingtonstem.org, 2016.

- In 2014, only 43 percent of U.S. high school graduates were ready for college work in math; 37 percent were ready in science. (*The Condition of College & Career Readiness. Iowa City, IA: ACT, Inc., 2014 < http://www.act. org/research/policymakers/cccr14/readiness.html>*)







Source: Guterl, Fred. "Diversity in Science: Where Are the Data?" Scientific American, 1 Oct. 2014, www.scientificamerican.com/article/diversity-in-science-where-are-the-data/.

The Adoption Committee will select instructional materials that are aligned to the WSSLS. The adopted materials will increase equitable access to all K-12 students and prepare them for success in core science courses in high school and college preparatory science courses (AP/IB). Moreover, the shift in science pedagogy embedded within this alignment provides all students with 21st century skills not previously embedded within science coursework, as described in Appendix D of the Next Generation Science Standards. This appendix highlights how these standards have been developed for all students, how these standards can be met and exceeded by students of color, students with disabilities, economically disadvantaged students, and English language learners.

2. How will leadership communicate key outcomes to stakeholders for racial equity to guide analysis?

In order to diversify communication channels and reach the maximum number of stakeholders, channels for communication with stakeholders will include the district Science Adoption webpage, district social media accounts, district newsletters, and printed materials be available in school offices. The SPS Science Program and Adoption Committee will communicate throughout the adoption process key outcomes to all stakeholders to be impacted by the adoption, including racial and ethnic communities as well as families of ELL, Special Ed, and HCC students.

- Application materials for the Science Adoption Committee for staff/teachers and for family/community members will be available to stakeholders through the communication channels above and will be available in four languages on Schoology and will be translatable into district languages on the SPS website. Adoption application deadline will be included on application.
- Selected K-8 Adoption Committee applicants were identified, confirmed, and committee membership was announced on June 13; 9-12 Adoption Committee applicants will be identified, confirmed, and committee membership will be announced on October 22.
- To ensure input and feedback from all racial and ethnic groups to be impacted by the adoption, as well as families of ELL, Special Ed, and HCC students, the Adoption Committee will engage stakeholder through the completion of a survey that will be communicated through the channels outlined above to elicit qualitative and quantitative data about their perceptions, attitudes, needs, and concerns as they relate to the adoption of science materials. The Adoption Committee will use this data in conjunction with the Race & Equity Analysis Tool and Instructional Materials Evaluation Criteria tool to inform their review and evaluate Instructional Materials for field-testing.
- The Adoption Committee will select and announce the candidate Instructional Materials for field-testing. Field test instructional materials will be on display for public viewing in multiple locations across the district. The Adoption Committee will elicit feedback from families and community members through both electronic and paper channels.
- Input and feedback from teachers about this experience with instruction, assessment, management, and preparation of the candidate instructional materials will be systematically collected throughout the field test and shared at a public hearing. Student feedback, input, and attitudes about engaging in shifts in science practice will be captured throughout the field test process to ensure student voice.
- Adoption Committee synthesizes and analyzes all input and feedback from all stakeholders on candidate instructional materials, including the field-test, and announces their recommendation for adoption to stakeholders via the communication channels outlined above.

3. How will leadership identify and engage stakeholders: racial/ethnic groups potentially impacted by this decision, especially communities of color, including students who are English language learners and students who have special needs?

The Adoption Committee will engage stakeholders, including administrators, teachers, families and the community in the instructional materials adoption with a Needs Assessment Survey to assess their needs, attitudes and concerns related to the selection of science instructional materials. To ensure equitable access to the input survey, it will be translated into the district's top four languages, be available in paper form, and open throughout the year so the community has multiple opportunities to access the survey either in paper form or electronically.

Administration, teachers, Seattle Public Schools Communications Team as well as community members will ensure our racial/ethnic groups, including communities of color, impacted by the adoption of new science materials receive and engage with the survey.

Racial Equity Analysis Tool

STEP 2: Engage Stakeholders in Analyzing Data

Stakeholders (SPS staff and community members) gather and review quantitative and qualitative disaggregated data and specific information to determine impacts or consequences.

1. How will you collect specific information about the school, program and community conditions to help you determine if this decision will create racial inequities that would increase the opportunity gap?

The application process will ensure that the Adoption Committee membership includes representation from Seattle's diverse racial and ethnic communities. The work sessions will be held when the committee members are available to meet. At the first meeting, the newly formed committee will determine future dates and locations to ensure the majority are able to attend. We will work with the ELL Department to have translators and transportation for committee members. The Adoption Committee will analyze qualitative and quantitative data and engage in sense making of patterns and trends from the input survey in order to ensure racially equitable outcomes for the selection of science instructional materials. The evaluation tool used by the Adoption Committee has criteria addressing racial equity to help screen materials; this criterion was developed using multiple resources including Washington Models for the Evaluation of Bias Content in Instructional Materials.

According to a 2017 statewide data survey from Washington STEM, 94% WA voters believe that every child in the state should have access to a high-quality STEM education in Washington's K-12 public schools. 83% believe that a high-quality STEM education is a "necessary part" of the state's obligation to provide "basic education". 88% of WA state residents agree that children who live in poverty have a better chance to break the cycle of poverty if they have a strong STEM education.

2. Are there negative impacts for specific student demographic groups, including English language learners and students with special needs?

Currently not all students receive equitable access to science instruction and materials. This is particularly impactful to our underserved populations of students, including English language learners and students with special needs. The adoption of new science materials will address the need to provide science learning that will include multiple modalities in both instruction and assessment.

Chapter 11 of the NRC Framework for K-12 Science Education acknowledges that in schools serving the most academically at-risk students, there is "today an almost total absence of science in the early elementary grades. This is particularly problematic, given the emerging consensus that opportunities for science learning and personal identification with science—as exemplified in this framework—are long-term developmental processes that need sustained cultivation. In other words, the lack of science instruction in early elementary school grades may mean that only students with sources of support for science learning outside school are being brought into that long-term developmental process; this gap initiates inequalities that are difficult to remediate in later schooling."

According to a study published in 2013 by the ASPIRES Project, a student's science aspirations and views of science are formed during the primary years and solidified by the age of 14. The study concludes that efforts to broaden students' aspirations in relation to science and engineering should begin in the primary grades, and that "the current focus of most activities and interventions – at secondary school – is likely to be too little too late". The research is clear: a strong cradle to career STEM education prepares students for high-demand jobs and contributes to the vitality of their families, communities, and local economies.

Racial Equity Analysis Tool

STEP 3: Ensuring educational and racial equity /Determine Benefit or Burden
Stakeholders (SPS staff and community members) collaborate to analyze how this policy/ decision/proposal/initiative/budget issue will increase or decrease educational and racial equity.

The Adoption Committee will be comprised of a diverse representation of stakeholders who will engage consistently throughout the adoption process to collaboratively analyze the potential outcomes of decision-making to ensure equity, including:

- The Race Equity Analysis Tool serves to guide the adoption process from communication, evaluation, selection and onto implementation of adopted instructional materials.
- Analyze data collected from the family and community stakeholder input survey.
- Analyze instructional materials using the Instructional Materials Evaluation Criteria Tool, which includes category #3: *Accessibility for Diverse Learners* and category #4: *Evaluation of Bias Content.*
- Analyze feedback data from teachers, students, families, and community members about the candidate instructional materials used in the field-test.

1. What are the potential benefits or unintended consequences?

The adoption of instructional materials will provide a common scope and sequence of instructional units across the grade levels, across the district. The impact of transient students, who are more often students of color, English language learners, and students with lower socio-economic status, will be minimized; therefore, the impact of student learning will be minimized. The adoption of science materials will also ensure, regardless of the schools' demographics, all schools will receive equitable distribution of the same materials. By providing students with aligned core science units in all buildings, students who move schools have less "catching up" to do while already experiencing the significant life change of moving. Teaching a common scope and sequence of units will maximize the teacher's ability to participate in a professional learning community focused on analyzing student work to improve instruction and to shift their practice to align with the new state standards thus providing more equitable outcome for students. As students continue to experience the pedagogical shift of the WSSLS, new instructional materials in K-12 will provide the foundation of science learning for all students to be successful in high school and to be college ready.

To ensure that this adoption does not result in the unintended consequence of perpetuating the current educational and racial inequities in our district, the adoption committee must analyze how the adoption process and implementation of the adopted materials will:

- Include sustainability of teacher supports, including materials, technology, instruction, and pedagogy.
- Provide continued ongoing professional learning for teachers around shifting classroom instruction and pedagogy to equitable teaching practices, including learning opportunities that support teachers in developing and maintaining a growth mindset.
- Include an ongoing data collection from students, teachers, and other stakeholders about attitudes and perceptions of science learning and teaching as a result of the adoption. Analysis and evaluation of this data must be used for ongoing modification and optimization of the adopted instructional materials to ensure equitable learning outcomes for all students over time.

2. What would it look like if this policy/decision/initiative/proposal ensured educational and racial equity for every student?

By increasing access of all students to science, particularly students of color, English language learners, and students with special needs to science, Seattle Public Schools will continue to prepare students for STEM fields. As previously mentioned in Step #1: students of color have inequitable STEM field and college preparatory classes. The adoption of high quality, culturally responsive, standards-aligned instructional materials, that feature culturally relevant science phenomena and engineering design opportunities, will empower students to see themselves in a potential STEM-field career. The pedagogical methods embedded in the aligned instructional materials will support students in "thinking like a scientist/engineer" as they learn how to "figure out/problem solve" instead of simply "learning about". Accordingly, this can increase the educational opportunities of these students, including increased access to college preparatory science classes (AP/IB), as well as increased opportunities to colleges, universities and STEM fields.

Racial Equity Analysis Tool

STEP 4: Evaluate Success Indicators and/or Mitigation Plans

Stakeholders (SPS staff and community members) identify ongoing measures of success or mitigation plans for negative impacts

1. How will you evaluate and be accountable for making sure that the proposed solution ensures educational equity for all students, families and staff?

   The Science Program, as well as individual teachers and schools will continue to assess the successes of all students in science learning. The completion of science summative assessments of student learning from each unit will provide quarterly student growth data and can be disaggregated for racial and ethnic groups, English language learners, and other underserved student groups. The WCAS high-stakes assessment also provides an opportunity for teachers, schools, and Seattle Public Schools to evaluate the performance of different student groups on an WSSLS-based test. This data will inform teacher professional development learning in which teachers work together to refine, and improve shared pedagogy, instruction and materials through collaboration.

2. What are specific steps you will take to address impacts (including unintended consequences), and how will you continue to partner with stakeholders to ensure educational equity for every student?

   To continue to improve learning for all students, particularly the impact on students of color, English language learners, students with disabilities, and other student populations, the SPS Science Program, teachers, and schools will continue to qualitatively and quantitatively monitor the science achievements of all students using the formative and summative assessment systems provided by the instructional materials programs. The SPS Science Program will engage Special Education and ELL teachers through professional learning resources and opportunities in increasing embedded strategies to support students served in these programs and to engage in the aligned science coursework.

   To continue to improve science education in Seattle Public Schools for all students, the SPS Science Program will implement data driven gap-closing measurable outcomes such as

   - implementation of science discourse strategies to increase student voice for sense-making and development of academic language
   - launching units with culturally relevant science phenomena to provide equitable pathways to learn science content in the unit
   - embedded formation assessments providing frequent feedback for both students and teachers.

   The SPS Science Program will continue to seek resources for equitable teacher supports to implement the adopted science instructional materials, and maintain a robust student data gathering system to inform any optimization of materials. We will continue to elicit feedback from our stakeholders on student learning and attitudes to ensure equitable outcomes for students in our highly impacted communities before, during, and after implementation of the adoption of materials.

Attachment K: Accessibility/Consent Decree Compliance

To ensure maximal accessibility of all products purchased by Seattle Public Schools, and to comply with a 2015 Consent Decree relating to all electronic resources purchased by Seattle Public Schools, an internal audit of the accessibility of the District-Developed CHEM B instructional materials was conducted.

In April 2020, at the request of the Science Department, Michael Dickneite, Student Support Services Manager with the district's Special Education Department, conducted the accessibility audit. Below are the results of this review:

Curriculum	Status	Notes
District-Developed CHEM B Instructional Materials	Mostly compliant, with exceptions particular to student-facing items	A list of non-compliant items was presented to the Science department and work has begun on updating these items. Some items will require a contractor to complete (auditory descriptions of videos), the funds for which are included in the Fiscal Impact section of the BAR. Work is underway to reach full compliance, with the revisions being sent to Michael Dickneite for audit, with a targeted completion date of Summer 2020.

Attachment L

MEMO: 2019 Curriculum Adoption Teacher Survey: K-12 Science Adoption
TO: Curriculum, Assessment and Instruction
FROM: Research & Evaluation
DATE: March 22, 2019

Overview

A critical part of the district's process for adopting and implementing new curriculum materials is learning how to best support teachers, for example by providing professional development, support, and resources where they are most needed. Accordingly, the SPS Research & Evaluation (R&E), in partnership with the Curriculum, Assessment and Instruction (CAI) department administered a survey in February 2019 to certificated classroom teachers regarding their experiences with new or planned curriculum materials. The survey included question panels on K-5 English Language Arts, Middle School Math, and K-12 Science. This memo shares findings related to the K-12 science instructional materials adoption.

Response rates for science are detailed in the table below.

Table 1. Response rates

	Number of Responses	Response Rate
Elementary	437	20%*
Middle School	81	84%
High School	83	57%
TOTAL	**601**	**24%***

*Conservative estimate, as the anonymous survey was administered to all elementary teachers, and not all elementary teachers teach science.

Because there are three concurrent science adoption processes underway, this memo provides overall findings (i.e. aggregated across all respondents) as well as breakouts for **elementary**, **middle school**, and **high school** grades.

Current State

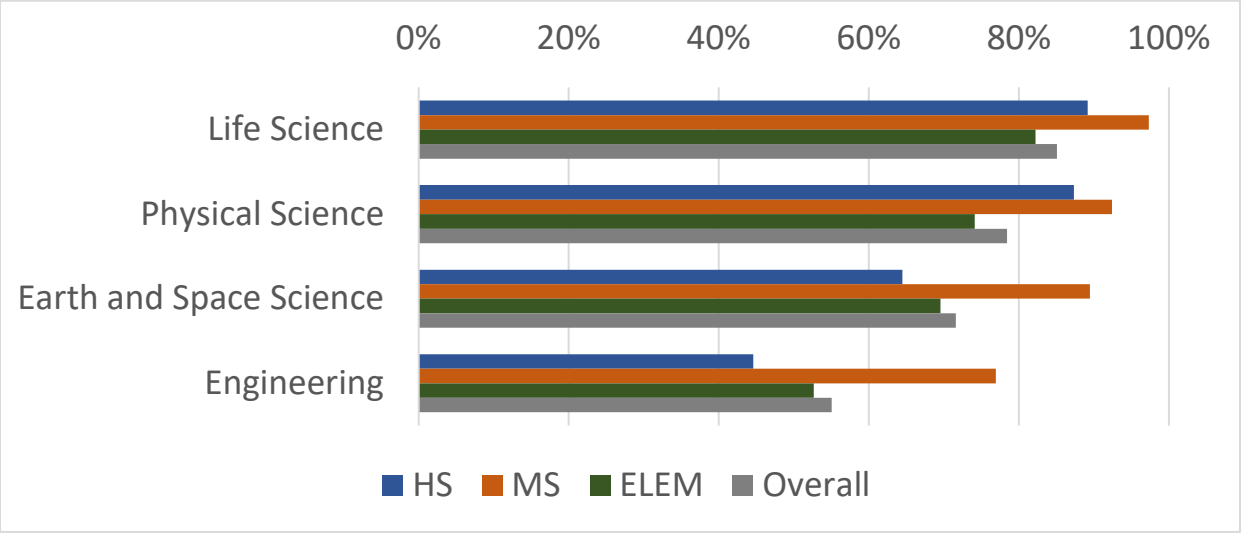
To calibrate the supports teachers need moving forward with NGSS-aligned instructional materials, it is first necessary to understand the supports that teachers currently use in the classroom.

- **Elementary**: Approximately two-thirds of elementary teachers (69%, n=435) report using the District FOSS/STC kits. The remaining one-third report using "other" materials, which are mainly materials being piloted through the adoption process, including AmplifyScience, HMH, McGraw Hill, STEMScopes, and TCI. However, some teachers also note that they teach Mystery Science, an online program, or use various other resources to teach science in elementary grades.
- **Middle School**: 17% of respondents report using District FOSS/STC kits, 30% report using waiver materials, and 53% report using "Other" materials. In the "other" category were mainly AmplifyScience users (28 teachers) and teacher-sourced materials (12 teachers).
- **High School**: The vast majority of high school teachers (89%, n=79) report using "Other" materials. Commonly mentioned materials include PEER (for physics), CarbonTime (for biology) Living by Chemistry (for chemistry), and International Baccalaureate materials.

Looking across the grade bands, relatively few teachers (7%, n=595) report using Superintendent-approved waiver materials. However, 43% of teachers overall (n=596) mention that they "moderately" or "extremely" modify the curriculum currently in place. These percentages are approximately the same across all grade bands.

Additionally, we asked teachers about their current level of confidence in their content knowledge across the sciences. Looking across the grade bands, middle school teachers report higher levels of confidence than do their elementary and high school colleagues. Looking across the content areas, life science is the area with the highest level of confidence overall, and engineering is the lowest.

Figure 1. Confidence in science content



Finally, we asked about the extent to which teachers currently use formative assessments to inform their science instruction. Overall, 84% (n=572) of respondents report that they use formative assessments to inform instruction at least "a couple of times per unit." The reported rates of assessment use are higher in middle school (100%, n=79) and high school (89%, n=83) than they are in elementary school (78%, n=410).

NGSS Readiness

The Next Generation Science Standards (NGSS) were adopted by Washington state in 2013. The SPS CAI department describes the shift as following:

> *"Historically, science teaching has been focused primarily on content, but NGSS recognizes that 21st century skills involve a deep understanding of Science and Engineering Practices, Disciplinary Core Ideas (content), and Crosscutting Concepts that apply to all scientific disciplines. This shift in practice moves us towards a pedagogy that focuses on 'figuring out instead of telling about.'"*

The NGSS contain eight approved practices of science and engineering that are considered essential for students to learn. Accordingly, we asked teachers the degree to which they feel confident in that their current instructional practices prepare students for these eight practices. Results, disaggregated by grade band, are in Table 2 below.

Table 2. Confidence by NGSS practice standard

	ELEM	MS	HS	Overall
Ask questions (for science) and define problems (for engineering)	68%	91%	80%	73%
Develop and use conceptual models	60%	92%	93%	69%
Plan and carry out investigations	71%	78%	75%	73%
Analyze and interpret data	66%	95%	90%	74%
Use mathematics and computational thinking	63%	74%	77%	66%
Construct explanations (for science) and design solutions (for engineering)	53%	92%	84%	63%
Engage in arguments from evidence	63%	96%	92%	72%
Obtain, evaluate, and communicate information	69%	92%	93%	75%

In addition to the eight practice standards, we probed on teachers' confidence in two areas of specific interest to Seattle Public Schools: technology usage and engaging students in scientific discourse with their peers. Results from these two questions are in Table 3 below. Similar to the previous findings, teachers in middle school report the highest levels of confidence (Table 3). High school teachers follow close behind, but elementary teachers report much lower levels of confidence in these areas.

Table 3. Confidence with technology and student discourse

	ELEM	MS	HS	Overall
I feel confident having my students use technology in the service of gathering scientific evidence	46%	96%	87%	61%
I feel confident that my students can engage in scientific discourse with their peers to make sense of complex scientific ideas	56%	89%	81%	64%

Professional Development

A key district strategy to increase teachers' confidence in science content and the NGSS practice standards is to provide targeted professional development. Accordingly, we asked teachers both about the professional development they have already received, as well as the professional development they would like to receive in the future.

Data indicate that a high proportion of teachers in high school (98%, n=83) and middle school (89%, n=81) have received specific NGSS professional development. Elementary teachers report lower PD participation rates on the NGSS (44%, n=436).

When we asked about the NGSS-aligned PD that teachers would like to receive in the future, we find that the types of PD vary quite a bit by grade band. Top areas for **elementary teachers** are developing student-centered units, developing assessments and analyzing student data, and deepening their content knowledge. Top areas for **middle school teachers** are developing student-centered units and navigating and understanding the curriculum resources. And top areas for **high school teachers** are

developing student-centered units, navigating and understanding curriculum resources, and incorporating instructional technology.

	ELEM	MS	HS	Overall
Developing student-centered unit that follow clear storylines to explain anchoring phenomenon	71%	54%	54%	67%
Navigating and understanding the curriculum resources	38%	47%	42%	53%
Deepening my content knowledge	48%	29%	23%	42%
Incorporating instructional technology	45%	20%	38%	41%
Developing assessments and analyzing student data	59%	39%	37%	40%
Other	14%	18%	26%	16%

As shown above, 16% of teachers (90 in total) indicate they would like "other" types of professional development. We analyzed open-ended responses about these other types of professional development and found some unifying themes:

- **Elementary teachers** want access to quality, NGSS-aligned materials that incorporates hands-on laboratory experiences for students. They also want more time to incorporate NGSS-aligned strategies and materials, including time for PD, time for collaboration with peers, and time to study the standards themselves.
- **Middle school teachers** want access to quality, NGSS-aligned materials as well. They also want guidance on facilitating culturally responsive student discourse in the classroom, for example by focusing on talk moves.
- **High school teachers** want access to high quality laboratory equipment, as well as specific PD on engineering and design content and problem-based learning (PBL). They also want to better understand how to differentiate science instruction within the context of NGSS.

Equity-Focused Open-Ended Responses

To conclude the survey, we asked teachers an open-ended question (no word limit) about the equity moves that a K-12 science adoption would bring. The question was:

> *"In 2018, Seattle Public Schools initiated an adoption process for instructional materials to support science in grades K through 12. Please tell us how the adoption of NGSS-aligned materials will influence your ability to offer equitable opportunities for all students to become scientifically literate."*

We systematically coded and analyzed open-ended responses, and three key themes emerged about teachers' hopes for the future science adoption: system-wide benefits, instructional quality, and student engagement and achievement. We detail the findings below, including quotes from **elementary teachers**, **middle school teachers**, and **high school teachers**.

System-wide Benefits

Teachers hope that a K-12 NGSS-focused science adoption will elevate the role and importance of science education in the district, enabling teachers to teach high quality science curriculum in all schools to all students. Elementary teachers believe that a common approach is an equity move particularly for high mobility students, as they will experience continuity in their science learning. And middle and high school teachers stressed the importance of having students enter secondary with common learning experiences and exposure to science instruction. Additionally, teachers anticipate that collaboration with peers, both within and across schools, will increase as well. However, teachers caution that system-wide benefits are only realized if the selected curriculum is high quality, if materials are distributed equitably, if meaningful professional development is delivered by the district office, and if the district and schools explicitly carve out time for teachers to teach science.

ELEM	*"It will prioritize and place a sense of urgency in science instruction, which currently is lacking due to our outdated materials."* *"If all classrooms are teaching a rigorous and engaging science curriculum in SPS and teachers are given excellent training, then I feel like this will provide an equitable opportunity for all students to become scientifically literate."* *"I am hoping more resources given to science at a district level will actually show teachers and students that the district cares about science instruction"* *"An adoption cannot influence equity without deep commitment from downtown to offer support, including opportunities for multisensory hands-on science activities and project-based science learning for all learners."*
MS	*"All students will have access to the process of doing science rather than only students at schools with outside funding. Students will learn current science rather than patchy obsolete topics."* *"I think NGSS aligned materials ensure that every student has access to the same content regardless of school. But really engaging puzzling phenomena are what makes equitable opportunities."* *"Based on the harsh reality that elementary schools do not consistently provide students with science learning the hope is that students would be moving to middle school with a better foundation of science so that literacy would be scaffolded providing more opportunities for science teachers to propel students' science learning."* *"As it stands, many teachers are doing different things or repeating topics with students over their time in Seattle Public Schools. A unified adoption will allow us to examine the trajectory of learning for students in the district and build on scientific thinking skills each year."*

HS	*"As a south Seattle teacher, I feel the adoption will greatly help my students. Students being able to move from one school another, but expect the same standards and classes helps our students be successful across the entire district. It also allows me to find support from other teachers and share expertise. This adoption is only good. I see no negative impacts."* *"The adoption process will allow us to work collaboratively across the district to identify the best resources and strategies for our students. It will allow students who move from one school to another to have an equitable experience. It will ensure that everyone is teaching with high quality, standards-aligned instructional materials."* *"It will help new and struggling teachers to make sure their expectations and content are aligned with other schools."* *"It allows us to know what instruction and opportunities are offered to students district-wide, so that we can ensure that our students at an underresourced high school have access to that same level of rigor and opportunity. If budgeted for, NGSS materials will also offer our students access to physical resources like lab materials that we currently struggle to purchase."*

Instructional Quality

Teachers hope that high quality, NGSS-aligned materials – combined with culturally responsive teaching practices – will allow them to engage *all* students in rigorous and engaging science content. Teachers mentioned both high quality, carefully scoped content, as well as the physical materials (e.g. kits and laboratory equipment) that will help them to achieve this goal, allowing them to focus on students' learning instead of curriculum development. Many teachers expressed frustration with their existing curriculum and science kits, saying they hope that newer materials will be better, easier to use, and more engaging for students.

ELEM	*"I am looking forward to teaching science with a curriculum that is well aligned to the standards. This is equitable because students across the district will have the opportunity to participate in high quality science instruction with high quality materials."* *"I teach at a Title I school with limited access to STEM experiences (although many of my students are very interested in engineering and scientific design). It is very apparent that equitable opportunities for all students are not currently a district priority as it relates to scientific literacy, and I would love to have the materials and resources needed to provide my students with 21st-century learning."* *"When I have provided materials and curriculum I am able to spend my time planning from formative assessment and thinking about how my questioning practices can support students; without materials and curriculum I do not have time to plan instruction in a deep and meaningful way."* *"I am hoping it will provide updated content that will engage students to think deeper about science. It would be nice to have a lot of hands on opportunities, provides culturally relevant examples and makes students think critically and design and communicate solutions to problems."*

	"Adopting a new curriculum based on NGSS will help our students learn the skills real-world scientists use. Hands-on exploration combined with digital models, constructive conversations, and opportunities to analyze and synthesize evidence gives opportunity for all students to access the content."
MS	*"If the curriculum that we adopt has clear storylines and anchoring phenomena, with opportunities for students to construct explanations and argue from evidence, then all students will be able to learn deeply, instead of just the students who are able to memorize a lot of facts out of a textbook."* *"I am a first year teacher who has no access to NGSS aligned curriculum from the district. Creating my own lessons and designing them or even just modifying them from the old kits is very time consuming and I do think it has weakened my teaching in the sense that not everything is mapped out and much of it is happening for the first time. Having a road map that was based on NGSS and some tried and tested units within that would give me a more solid base to fall back on and build from, rather that struggling to work with. This would create a more cohesive education for my students and therefore help increase their scientific literacy."* *"If the curriculum we adopt is truly aligned with NGSS, then it will engage students from all cultures and ability levels by engaging them in solving problems and answering questions that are relevant to them and guided by phenomena and storylines meaningful to all. It will be rigorous but well scaffolded and differentiated to meet the needs of ELL and learners of diverse abilities."*
HS	*"Having a reliable source of curriculum will allow me to spend more time on the students thinking and less on preparing materials."* *"Model based instruction based on phenomenon and real-life projects offers opportunities for all students to access scientific ideas and concepts as scientists, no matter their race, gender, ability or socioeconomic status. Discourse pushes all students to work at their level and build on their understanding, whatever that might be."* *"Teaching with a storyline is equitable because it provides all my students with a common starting point of understanding. The shared experience at the beginning of a new unit gives students common ground."* *"I will be able to focus much less on adapting materials and more on analyzing the work my students do."*

Student Engagement and Achievement

Teachers hope that new NGSS-aligned materials will help to engage students in authentic, hands-on learning experiences that center around a scientific phenomenon that students can relate to their own lives. This, they said, will help students who might typically not have enjoyed science become enthusiastic science learners. Teachers also asserted that interest and skills in science are necessary to succeed in the highly scientific and STEM-based economy into which they will graduate.

ELEM	*"The NGSS align with the currently STEM world that we are living in and that our students will be growing up to be working in. It's important to be stretching our students' thinking in the way that the standards ask and that the materials we are providing to teach are fun, engaging and accessible to all students."* *"By having layers of ways to explore a phenomenon, students take control of their own learning and have context upon which they can attach new learning. Without this, students already see themselves as "not scientists" by middle school."* *"The adoption of NGSS aligned units should provide a common entry point for students nationwide, and allow schools to access a common body of knowledge for equitable assessment."* *"STEM fields are where growth and profitability are in our economy right now so providing a curriculum that provides these skills will allow ALL students to have access to these careers in the future."* *"The NGSS-aligned materials will prepare students to perform well on the science portion of SMA. The NGSS standards have been in effect since 2013 and the district has not adapted a science curriculum to meet this standards. Students are not prepared to take take tests based on these standards, if they do not have the curriculum or materials available to them."* *"I believe a curriculum that is NGSS aligned will prepare my students for a world where science is everywhere. It will also better prepare them for high stakes testing that will ask them questions regarding modern science standards, not antiquated science kits that are older than some teachers at our school."*
MS	*"New NGSS-aligned curriculum needs to offer students an entry-point that is socially relevant to their lives. Students need to see why science matters to them."* *"The adopted curriculum NEEDS to have an interesting phenomena that ends in a casual, evidence based, explanation that students are invested in sharing and writing. Otherwise I worry that the difficult concepts and vocabulary heavy field of science will remain inaccessible to many."* *"We need to develop good strong, PBL, phenomenon driven projects kids can DO and feel proud in other to become scientifically literate."*
HS	*"If the materials are interesting, rigorous, and straight-forward to follow, then I will be able to inspire and motivate all students in my classes to understand how science connects to their lives and to engage in real science in the classroom."* *"Having aligned materials will help me collaborate with others to implement best practices, engineering practices, and relate phenomena that teach science in a way that allows students to be in the driver's seat and curious about what they are learning."* *"The NGSS requires students to act like scientists, rather than passively learning about others' discoveries. This is more engaging than the traditional approach and gives students all students the skills required to succeed in STEM fields."*

More Information

For more information about the survey content, administration, or findings, please contact the Research & Evaluation Department at research@seattleschools.org.