Edmonds
SCHOOL DISTRICT
Each student learning, every day!

School Board Regular Business Meeting
Minutes

June 22, 2021

To view recording or transcript highlight and right-click the link below
https://www.youtube.com/user/EdmondsSD

CALL TO ORDER

Director Kilgore called the Executive Session to order at 5:00 pm. The Board of Directors met with the Superintendent to provide his annual employee performance review. Director Kilgore adjourned the session at 6:05 pm.

Director Kilgore called the Business Meeting to order at 6:30 pm.

Present:	Ann McMurray, Gary Noble, Carin Chase, Nancy Katims, Deborah Kilgore
Staff Present:	Gustavo Balderas, Rob Baumgartner, Debby Carter, Helen Joung, Greg Schwab, Dana Geaslen, Victor Vergara, Lydia Sellie

LAND ACKNOWLEDGEMENT

Dr. Balderas acknowledged the original inhabitants of this place, the Sdohobsh people and their successors the Tulalip Tribes, who since time immemorial have taken care of, hunted, fished and gathered on these lands.

FLAG SALUTE

Director Kilgore led the flag salute.

APPROVAL OF AGENDA

Moved by Board Member Ann McMurray, Seconded by Board Member Carin Chase

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

APPROVE SCHOOL BOARD MINUTES FOR:

June 1, 2021-Study Session
June 8, 2021-Business Meeting

Moved by Board Member Nancy Katims, Seconded by Board Member Gary Noble

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

PUBLIC COMMENTS

Due to the COVID-19 pandemic the Board accepted written comments. Directors read the comments received.

Transcript will be attached to published minutes.

CONSENT AGENDA

Moved by Board Member Ann McMurray, Seconded by Board Member Nancy Katims A roll call vote was called

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

Approve Personnel Actions

1. Single reading, approve personnel actions.

Approve Bills: Vouchers audited and certified by the auditing office required by RCW 42.24.080, and those expense reimbursement claims certified by RCW 42.24.090 have been recorded and the listing made available to the Board.

1. Single reading, approve General Fund Vouchers, May 2021 Paydays

2. Single reading, approve Associated Student Body Fund Vouchers, May 2021 Paydays

3. Single reading, approve Capital Project Fund Vouchers, May 2021 Paydays

4. Single reading, approve Private Purpose Trust Fund Vouchers, May 2021 Paydays

5. Single reading, approve payment of employee reimbursements, ACH remittance of sales tax for various funds to the Department of Revenue and payroll direct deposit as summarized on the Auditing Officer's Certification, May 2021 Paydays

6. Single reading, approve payroll vouchers as summarized on the Auditing Officer's Certification. There are no payments for employee taxable meal reimbursements requiring separate board approval in these payroll vouchers.

Miscellaneous Consent Items

1. Single reading, approve Memorandum of Understanding for Voluntary Employee Benefits Program (VEBA) for the Administrative Assistants 2021-22

2. Single reading, approve Memorandum of Understanding regarding the provision of Occupational and Physical Therapy services for the 2021-22 school year.

3. Single reading, approve Waiver regarding Administrator Directed Time for the Itinerant Support Services Department for the 2021-22 school year.

4. Single reading, approve waiver for planning periods at Alderwood Middle School for the 2021-22 school year.

5. Single reading, approve waiver for a modified calendar at Edmonds Heights K-12 for the 2021-22 school year.

REPORTS

1. Superintendent Dr. Gustavo Balderas and district leaders provided a Re-Entry Update.

   Presentation is attached

2. Deborah Brandi, Executive Director of the Foundation for Edmonds School District (FESD) provided an update on the work they have been doing to support the district, students and families.

   Presentation is attached

3. Superintendent Balderas and Transportation Director Ben Mount, provided a Transportation Report.

   Presentation is attached.

4. Executive Director of Student Learning Rob Baumgartner and Jennifer Hageman provided a High School General Chemistry and Science Adoption Presentation.

   Presentation and report are attached.

UNFINISHED BUSINESS

1. Second reading, adopt iReady Math Assessment System

Moved by Board Member Ann McMurray, Seconded by Board Member Gary Noble Dr. Balderas provided the Board with a correction to the i-Ready recommendation stating the 21-22 school year's Dyslexia screener will be Acadience, not i-Ready. An amendment to remove the i-Ready recommendation for the 21-22 Dyslexia screener was made.
A roll call vote was called to amend the recommendation.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

Moved by Board Member Nancy Katims, Seconded by Board Member Carin Chase An amendment was proposed to change the recommendation from "require the use of i-Ready Math Diagnostic and Online Instruction in grades K through 8" to "require the use of i-Ready Math Diagnostic and Online Instruction in grades 1 through 8". After a discussion a roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Deborah Kilgore

Nay: Board Member Carin Chase, Board Member Nancy Katims

Passed

Moved by Board Member Ann McMurray, Seconded by Board Member Gary Noble A motion was made to approve the amended recommendation.
A roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Deborah Kilgore

Nay: Board Member Carin Chase, Board Member Nancy Katims

Passed

2. Second reading, adopt High School General Chemistry and Science Materials as recommended.

Moved by Board Member Ann McMurray, Seconded by Board Member Gary Noble A roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

3. Second reading, adopt revised Policy 5202- Federal Motor Carrier Safety Administration Mandated Drug and Alcohol Testing Program.

Moved by Board Member Gary Noble, Seconded by Board Member Nancy Katims A roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

NEW BUSINESS

1. Single reading, approve renewal of agreement by & between the Foundation for Edmonds School District and Edmonds School District #15

Moved by Board Member Gary Noble, Seconded by Board Member Ann McMurray A roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

2. Single reading, approve Resolution #21-25, Intent to Construct Spruce Elementary School Phase 2, Addition and Replacement.

Moved by Board Member Nancy Katims, Seconded by Board Member Ann McMurray A roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

3. Single reading, approve purchase of five school buses.

Moved by Board Member Ann McMurray, Seconded by Board Member Gary Noble A roll call vote was called.

Aye: Board Member Ann McMurray, Board Member Gary Noble, Board Member Carin Chase, Board Member Nancy Katims, Board Member Deborah Kilgore

Passed - Unanimously

BOARD MEMBER COMMENTS

Director Katims said she appreciated the open discussion. She said she is excited about the new Science curriculum and that Spruce will have groundbreaking tomorrow. She shared graduation was a pleasure to attend.

Director McMurray shared while attending graduation she thought about the amazing year and the ability to be there was due to everyone working together, students, staff, families, and the community. She said students were so appreciative for an in person ceremony in the stadium with the community, and it was wonderful. She had appreciation for the discussion this evening, explaining that having a civil disagreement and discussion needs to be modeled. She thanked her fellow board members for passion and sharing concerns.

Director Chase said as directors and elected officials they will not always agree, and it is healthy to ask questions and model for the community. She shared there is a legislative reps meeting this weekend to review and vote on permanent and new positions that will be voted on. She was happy to attend graduations.

Director Noble said this is the best time of year to see kids graduate and that is the goal, to get them through the system. He shared it is exciting to see the fruit of all their work. He said this was the most excited graduating class ever seen.

Director Kilgore shared she thoroughly enjoyed the graduations. She stated for the record the Board had met in Executive session prior to the Business meeting to provide the Superintendent's annual review to Dr. Balderas, and it will be placed in the public record. She said she had attended Equity Summit panel discussions with the Education Secretary. She said she was hoping to get an understanding why people are opting not to return to school next year. Staff will ask people why they are not returning.

SUPERINTENDENT'S COMMENTS

Dr. Balderas shared all the graduations were phenomenal. He noted summer school will be starting soon and staff are planning for fall. He said he would keep the Board apprised on vaccinations and any changes with Department of Health or Labor & Industries guidance as we move into fall. He noted we will continue to do the best for our kids. He thanked the Board for their time, effort, and guidance throughout te past year and said he is looking forward to the work ahead.

FUTURE BOARD MEETING DATES

June 24, 2021-Study Session-Board Leadership Training
June 25, 2021-Study Session-Board Leadership Training
July 13, 2021-Business Meeting

ADJOURNMENT

Director Kilgore adjourned the meeting at 9:48 pm.

_____

Deborah Kilgore, Board President

_____

Gustavo Balderas, Board Secretary/Superintendent

EDMONDS SCHOOL DISTRICT BOARD OF DIRECTORS

Carin Chase	Term Expires Dec. 2023	Director District #1
Ann McMurray	Term Expires Dec. 2021	Director District #2
Gary Noble	Term Expires Dec. 2023	Director District #3
Deborah Kilgore	Term Expires Dec. 2021	Director District #4
Nancy Katims	Term Expires Dec. 2023	Director District #5

Public Comments Transcript 6.22.21

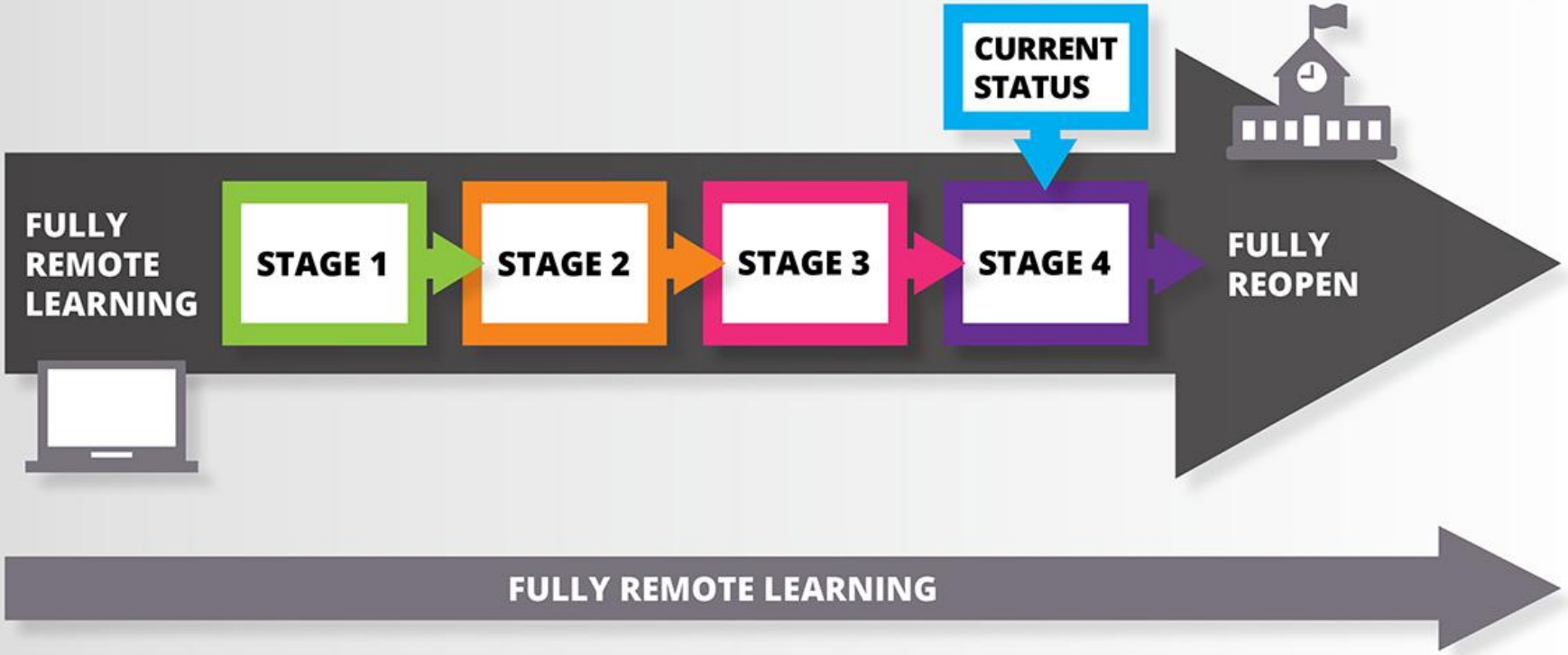
Melissa Petersen	therapy animals	Edmonds WA 98026	I have recently learned that the Edmonds Therapy Animal policy has changed, and now disallows all therapy animals in Edmonds (including registered therapy animals supporting an educational program). As a staff member who worked with a trained, registered therapy dog in the past in several different Edmonds schools, learning of this change was extremely disappointing. I worked with my therapy dog Ginger supporting students who received speech/language therapy for almost 10 years in Edmonds, and now that the policy has changed, I am unable to register a new dog to provide this support in the future. I do not understand why registered, insured therapy animals have been banned by the safety officer in Edmonds. Because of the ADA he was not able to ban service animals assisting a specific person who has a disability, but all other therapy animals have been prohibited. As an SLP who has provided Animal Assisted Therapy to many students in the past, I can attest to the benefits of providing trained therapy animals to support student needs at school. Especially now, when our student social/emotional needs are the most intense they have ever been, it would be extremely helpful for the Board to allow registered therapy animals to provide therapeutic support within Edmonds School District programs. Thank you.
Aaron M Holder	Equity, Reopening, Data, and Next Year	lynnwood	As this school year comes to a close, if we truly want to feel proud of our work, it is important to reflect on concrete data that will help us know the actual impact of choices that we have made. In January the district presented data from Panorama surveys as evidence of student disconnection and deteriorating mental health. It was a central argument towards reopening schools at both a local and state level. End of year Panorama data shows that while reopening did have a positive effect on connectedness – about a 10% increase if we view the data in the most favorable light – it was hardly a cure-all. 1 out of every 2 elementary students and 3 out of every 4 middle and high school students continue to feel disconnected in our schools. The district has spoken about equity and a desire to support our most vulnerable learners. However, demographic data around which families opted back into our buildings was only compiled by the district after the board asked for it – and the board only asked for it after I asked. When inequities were found, such as our lower number of AAPI students enrolled in hybrid, they were glossed over and dismissed. When Principals were asked if they were using the data to identify students who were struggling and not in hybrid, the Principals said that they had not tried to identify those students.

			This shows a worrying pattern. Demographics and data are used to push agendas, but never revisited to hold ourselves accountable. It shows a need for reflection and equity work at a district administration level beyond 'planning professional development for staff and hiring leaders with compelling track records.' These issues existed before the pandemic and the bulk of the work requires far more than just reopening schools. That is all we have done. If any of the concerns this year, from academic achievement to mental health, has been serious to the board or administration then it is time to follow through on doing more than just reopening schools. Next school year cannot be a return to the old normal, or we will have failed our students and shown our true values.
Sarah Thompson	Re-Entry Update	Brier, WA 98036	As a parent and teacher in our district, I am very concerned about class sizes for the 2021-2022 school year. I am hearing of classrooms at my younger son's school that are already at trigger, and this does not take new students who might enroll over the summer into account. The Covid-19 pandemic is not over, especially considering the fact that our elementary students are not yet old enough to be vaccinated. To overcrowd classrooms and have them even close to trigger when our students can't protect themselves medically does not help to assure their safety and health. Reducing class sizes should be a priority for our district, at the very least for next year. I want very much to send my youngest son back to school in person at our neighborhood school, but how can we feel safe doing that if there are 30+ students in his classroom, as has been the case in recent years at our school for grades 4 to 6? There are significant academic benefits to reducing class sizes as well that I ask you to consider. Everyone will be more successful this year--students and teachers--with reduced class sizes. Thank you for your time and consideration.
Sharon Kulseth	When will the Edmonds School Board resume in person meetings?	Edmonds, 98020	As the state is resuming "normal" activities, many people would like to see the board regular meeting procedure and discourse.

Edmonds School District Re-Entry Update

Tuesday, June 22 2021

Edmonds Schools Stages of Re-entry



Congratulations to the Class of 2021!

Congratulations to the Class of 2021!

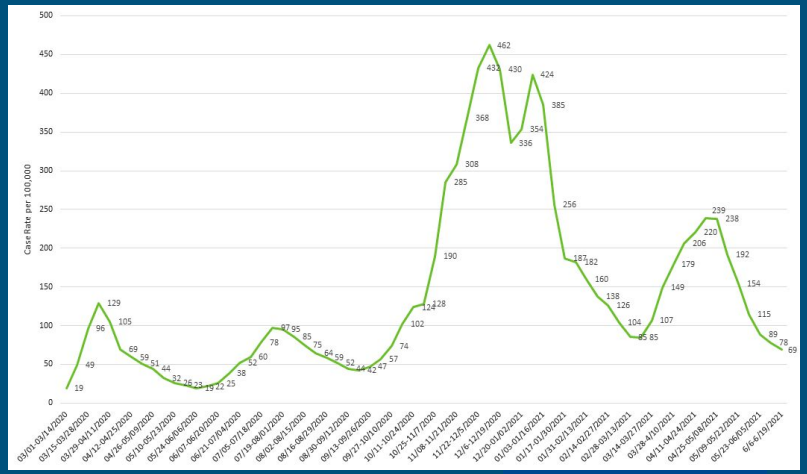
- 1,508 students received their diplomas
  - Meadowdale High: 369
  - Edmonds-Woodway High: 345
  - Mountlake Terrace High: 327
  - Lynnwood High: 325
  - Edmonds eLearning Academy: 55
  - Edmonds Heights K-12: 52
  - Scriber Lake High: 35

DOH latest update

2021-2022 WA DOH School Guidelines-current

- All will have the opportunity to attend school in-person **5 days** a week
- Currently mask wearing still required for schools
- Social distancing is still required with recommendations of 3 ft within the classroom and 6ft elsewhere to greatest extent possible (need to ensure schools are able to provide full-time in person instruction)
- **Traffic control paths, classroom seating maps, cleaning, handwashing, ventilation, signage, COVID response plan, and case reporting and tracing still required**
- Attestations for staff and students end June 24th!
- **An update of the guidelines is expected from WA DOH and L&I guidelines by end of July**

Snohomish County Picture



Continued downward COVID-19 case trend!

- 69/100K average over the past 14 days ⬇
  - Lowest since September 2020
- 4.8% positive test rate ⬇
- 57 confirmed positive cases in the past week ⬇

SNOHOMISH HEALTH DISTRICT
WWW.SNOHD.ORG

PUBLIC HEALTH
always working for a safer & healthier
SNOHOMISH COUNTY

Edmonds School District

- 1-7 Curative tests daily (positive test rate less than 1%) ⬇
- School trends are down overall in past two weeks ⬇
  - ESD trends down significantly with 1-4 cases per week in the past 4 weeks
  - Month of April and May was 4-17 per week

Summer Learning Update

K-8 In-person and Online Summer Programs begin on Tuesday, July 6 and runs through Thursday, August 5.

High School Summer School begins on July 6 and runs through Thursday, August 12.

Summer School Staff training starts on Monday, June 28.

Summer Learning Update

K-8 Summer Learning Enrollments

- In-Person Program - currently 976 students enrolled
- Online Program - currently 1220 students
- ECEAP Summer Program - 40 students
- ML Summer Program- 62 students (continued outreach)
- Special Education ESY- 52 students

HS Summer School

- Currently 843 students enrolled for either in person or online
- Continuing to enroll students this week through counselors only

2021-22 School Year

- In-person learning full time
- Options for remote:
  - Edmonds K-8 Online Academy
  - Edmonds eLearning Academy

2021-22 School Year

- Student Intent Form
  - Families can change intent between Monday, Aug. 2 - Friday, Aug. 6
  - Student-specific link will be emailed to families
  - If no change, no response is needed
- Information is critical for staffing schools

Edmonds
SCHOOL DISTRICT

2021

High School Science Adoption

GENERAL CHEMISTRY AND SCIENCE MATERIALS

Student Learning

Edmonds School District

6/8/2021

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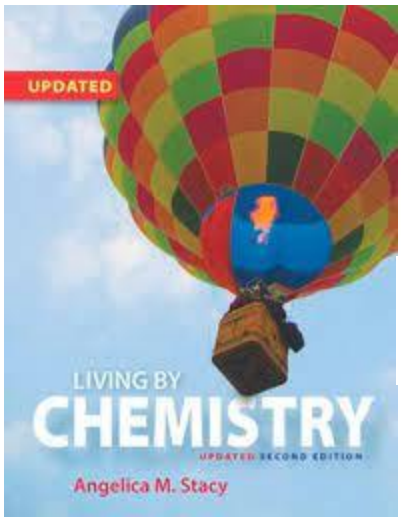
RECOMMENDATIONS

RECOMMENDATION I

Following the Edmonds School District's Science Adoption process implemented from January 2019-June 2021, the Instructional Materials Committee, Materials Review Committee, Pilot Committee, Student Learning Team, with the support of parents, families, community members, and students of Edmonds School District formally recommend adopting the Living By Chemistry textbook and instructional materials for high school Chemistry. Implementation of this program will require the purchase of both digital licenses and physical textbook materials and supporting teachers with ongoing job-embedded professional development.



SaplingPlus

bedford, freeman & worth
high school publishers

RECOMMENDATION II

In order to provide equitable access to the Next Generation Science Standards Science and Engineering Practices, the Instructional Materials Committee, Materials Review Committee, Pilot Committee, Student Learning Team, with the support of parents, families, community members, and students of Edmonds School District formally recommend the purchase of up to date science materials. Teachers will be supported with job-embedded professional development.

Vernier

Sensors

Software

INTRODUCTION

RATIONALE FOR CHANGE AND SCIENCE VISION

WHERE WE HAVE BEEN, WHERE WE ARE, WHERE WE NEED TO BE

In order to improve student outcomes in science we must first shift teacher practice. This process begins by understanding our current constraints in science instruction. Presented in this document is a detailed account of the Chemistry Curriculum adoption process and the rationale for equitable distribution of science equipment within our district. Although originally slated as a 9-11 Core Science course adoption, we are prioritizing our need for updated science materials and curriculum for chemistry, as the other core courses are engaged in an Open Educational Resource curriculum development process and have an alternative timeline.

WHERE WE HAVE BEEN

The Edmonds School district last adopted High School Science curriculum in 2005, eight years after the release of the initial Washington State Science Learning Standards. Before the roll out of the modified 2009 Washington State K-12 Science Standards, extensive efforts went under way to align course materials to the standards. The Biology End of Course Exam was utilized as both a federal accountability and graduation required assessment, so naturally this course was supported with additional professional development to improve student success. However, with the state adoption of the Next Generation Science Standards (NGSS), now called the *Washington State 2013 K-12 Science Learning Standards,* expectations of learning moved from a siloed content area (Biology) to a breadth of science content areas: Life Science (Biology), Earth and Space Sciences, Engineering, and Physical Sciences (Physics and Chemistry). In order to ensure alignment to standards a detailed data driven review was conducted in the 2016-2017 school year.

Although teachers worked diligently on the adjustment of course materials to align to NGSS, it is evident form the 2015-2016 Science Course Pathways that there was extreme variability in the science requirements and opportunities for students in the Edmonds School District.

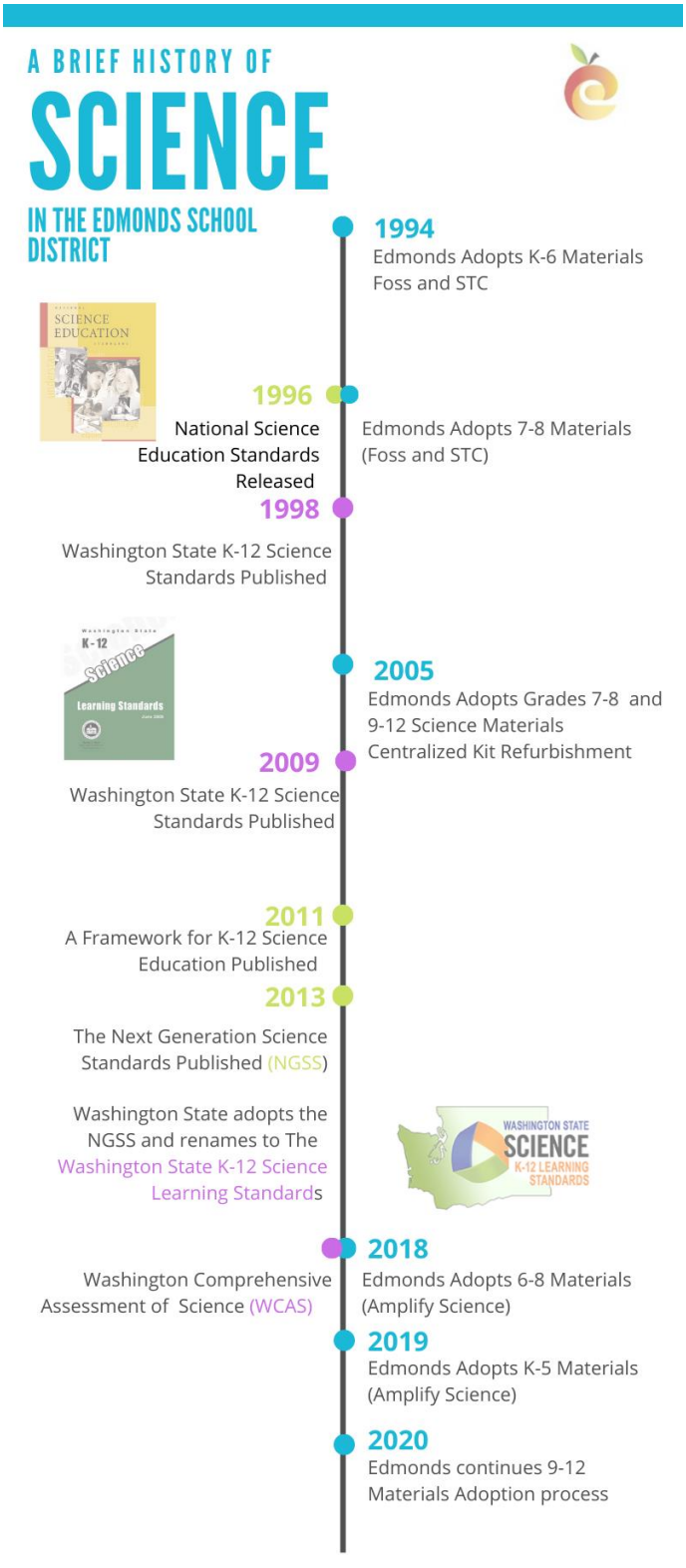


Figure 1: Timeline of National and State Standards Development and District Level Science Adoptions from 1994-current (to right)

Prior to 2016-2017 school year, there was also no common course description language. Common Course descriptions have been written for use in the 2017-2018 school year and course catalogs. For the 2017-2018 school year, each high school offered the following courses to cover the breadth of NGSS domains: Earth Space Science, Biology, and Physical Science.

- Curriculum Framework Development Process
- NGSS Course Alignment Final Steps
- Example Curriculum Framework

High school science staff developed draft curriculum frameworks in June 2016 that align to the 2013 Next Generation Science Standards for two science courses: Physical Science and Earth Space Science. These courses will replace Integrated Physical Science and Global Science/Issues and will be common courses offered at each school in the district. The frameworks were piloted in 2 buildings for data collection and were revised in spring 2017 with release of the full framework for the 2017-2018 school year. For each unit, resources and activities were identified that support student learning around the specific standards. At least 1 STEM or Engineering Design activity was identified for each unit of study to align to both the NGSS Engineering and Technology standards and the STEM for ALL Initiative. Biology, Physics, and Chemistry draft frameworks were completed spring 2017. After the adoption of Amplify Science K-8 in 2018 and 2019 it was determined that in order to have full vertical alignment to the Washington State Science 2013 Learning Standards (NGSS), that our core high school science courses would need to modernize both science equipment and curriculum resources.

Course	Textbook	Publisher	Pub. Year	Adopted	Grade Levels/ Sites
Biology	Biology (Miller-Levine)	Prentice Hall	2004	2004	9 & 10
Global Science	Concepts in Action with Earth and Space Science	Prentice Hall	2004	2004	9 & 10
Integrated Physical Science	Conceptual Physics (Hewitt)	Prentice Hall	2006	2005	EW, MT, SL
Integrated Physical Science	Hewitt Conceptual Physical Science (supplement)	Prentice Hall	2002	2004	9-10 (supplement)
Chemistry	Introductory Chemistry (Zumdahl) 3rd Edition	Houghton Mifflin	2004	2005	LH,EW,MD,MT,SL
Physics	Physics, AP (Walker) 2nd Edition	Prentice Hall	2004	2005	EW, MT, MD, LH

Table 1: Current Edmonds School District High School Science Materials by Publication and Adoption Year

WHERE WE ARE

We currently implement curriculum aligned to outdated standards for grades 9-12 in the Edmonds School District. Washington State adopted the Next Generation Science Standards (NGSS) in 2013, now known as the *Washington State 2013 K-12 Science Learning Standards.* Washington State released a science assessment that is aligned to the NGSS in the 2017-2018 school year known as the *Washington Comprehensive Assessment of Science* (WCAS). The WCAS assessment is currently taken in Edmonds School District in the 5th, 8th, and 11th grade levels and covers all core

science content areas. Although, many steps were taken to ensure student access to the standards through the Curriculum Framework Development process, adopted resources are not aligned to either set of standards (2009 or 2013), current event topics are aged, and instructional strategies have evolved since publication. Due to the lack of alignment and relevance, each building has designed units of study that utilize key laboratories, activities, and physical materials that supplement their designed units. The physical texts are rarely used in classrooms. The previously adopted materials do not align with the developed curriculum frameworks currently in use. This has created inequity and institutional barriers for students across the district for many years depending on how much time and resources were allocated by buildings for this purpose.

In addition, buildings do not have the resources or physical materials needed to engage in the Engineering and Technology Standards for NGSS or to prepare students for post-secondary success in STEM fields or college courses. Scientific instruments, such as probe ware, and data collection software should be part of the core student experience. Unfortunately, teachers use department or even personal funds to provide students with engineering experiences in the classroom, therefore each building and classroom has varying levels of engagement in STEM, Engineering Design and Technology. Staff need specific training in the implementation of Engineering Design as well as access to materials and resources. Professional development around the instructional shifts in NGSS and new units of study in the curriculum frameworks is ongoing for Learning and Leading team members, but all staff need time and opportunity to engage in this work across the district for consistency in implementation. Although there have been a multitude of differentiated learning experiences and professional development opportunities across the district for the past 6 years, high school science teachers need additional job embedded professional leaning on pedagogical shifts in NGSS, access to aligned curriculum and assessments, and modern future-ready technology and engineering instruments and tools in order to prepare our Edmonds students for real world success. Snohomish STEM, our Washington STEM support network, has conducted detailed research on the impact of K-12 STEM learning on post-secondary success and career access. “The Snohomish Region is home to historically robust STEM industries, spanning from advanced manufacturing to information technology, served by the Snohomish STEM Network and its cross-sector partners. By 2030, 79% of high-demand, family-sustaining wage jobs available in our region will require a postsecondary degree or credential; 50% of those jobs will be STEM or STEM literacy-based occupations. However, students in the Snohomish Region are not equitably or adequately prepared to take advantage of these opportunities, with only 42% of the high school cohort of 2019 projected to be on track to attain postsecondary credentials.” (Washington STEM Report, 2020). Providing students with STEM experiences, activities, and laboratories with real world equipment and technologies is one of the first steps in narrowing the achievement gap in science.

Figure 2: Students Utilizing Chemistry sensors for titration laboratory while analyzing data output on computer

WHERE WE NEED TO BE

“The NGSS offer a vision of science teaching and learning that presents both learning opportunities and demands for all students, particularly student groups that have traditionally been underrepresented in the science classroom. Furthermore, the NGSS are connected to the Common Core State Standards for English language arts and mathematics. Changes in the new standards occur as student demographics in the nation become increasingly diverse while science achievement gaps persist among demographic subgroups. The academic rigor and expectations of the NGSS are less familiar to many science teachers than conventional or traditional teaching practices and require shifts for science teaching, which are consistent with shifts for teaching the CCSS for English

language arts and mathematics. Science teachers need to acquire effective strategies to include all students regardless of racial, ethnic, cultural, linguistic, socioeconomic, and gender backgrounds. While effective classroom strategies that enable students to engage in the NGSS will draw from the existing research literature, the NGSS will also stimulate new research agenda. For example, future research may identify ways to make connections between school science and home/community for non-dominant student groups as they engage in the NGSS. Future research may also explore how to utilize and allocate school resources to support student learning in terms of material resources, human capital, and social capital in relation to the NGSS. Effective implementation of the NGSS for all students, including non-dominant student groups, will require shifts in the education support system. Key components of the support system include teacher preparation and professional development, principal support and leadership, public-private-community partnerships, formal and informal classroom experiences that require considerable coordination among community stakeholders, technological capabilities, network infrastructure, cyber-learning opportunities, and access to digital resources, online learning communities, and virtual laboratories. As the NGSS implementation takes root over time, these components of the education system will also evolve and change accordingly."

Figure 3: OSPI's NGSS infographic for the 2013 Washington State Science Learning Standards

ADOPTION PROCESS

Figure 4: Overview of Adoption Process Stages

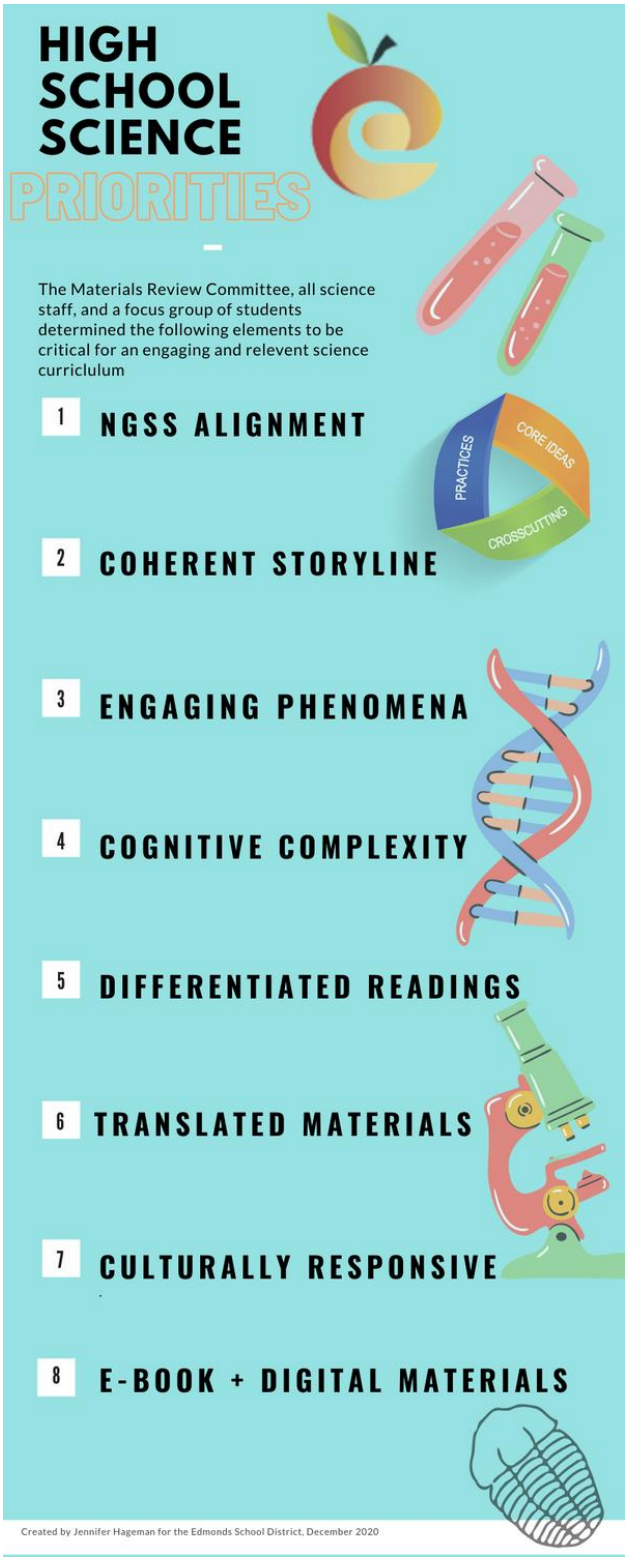


Figure 5: High School Science Needs Assessment Priorities Infographic

INITIAL NEEDS ASSESSMENT AND COMMITTEE FORMATION

NEEDS ASSESSMENT

The intent to review curriculum materials was communicated to all high school science teacher and administrators in January 2019. From February 25- March 15th 2019, the science needs assessment was conducted. Jennifer Hageman visited each school site (see Timeline of Adoption events starting on page 12, for details) and facilitated a needs assessment and criteria ranking process via dotstorm, a software that allows members to prioritize criteria. A small focus group of 5 students from various high school sites were asked to develop their own list of criteria through the same process. After all sites and the student focus group developed a prioritized needs assessment list, the criteria shared and voted on. Eight core priorities were identified by students and teachers, as shown in infographic the left.

COMMITTEE FORMATION

MATERIAL REVIEW COMMITTEE

All buildings were asked to have a least two science teachers on the Materials Review Committee (MRC). All content areas and building sites were represented and proportional demographic representation to all high school science teachers in the district. These 11 teachers have spent countless hours committed to this process and securing resources for our students, truly acting as exemplary teacher leaders. After the initial screening and review of materials it was determined that content based sub committees would review and pilot curriculum materials, as they are experts on the given subject areas. In this way, Special Education and English Language teachers and staff could also review materials through the specifics of each individual course.

CONTENT AREA COMMITTEES

The Content Area Committee's primary role in this process was to review individual course materials in a given subject area, in this

case Chemistry, providing insight and feedback on depth of coverage, consistency of storylines, and relevancy of phenomena. Both the MRC and Content Committees completed the detailed rubric evaluations for analysis in the adoption process.

PILOT COMMITTEE

All chemistry teacher were provided the opportunity to pilot curriculum. A total of 5 teachers at 2 school sites expressed interested in piloting the curriculum. It is important to note that high school science teachers often teach in multiple content areas. Due to this fact that a majority of our MRC and content area teachers were also in the midst of reviewing and piloting curricula in other content areas (namely, Earth Space and Physical Sciences), so participation in the was Chemistry pilot was limited in scope. In hindsight, focusing on one content area at a time would be beneficial to allow all teachers the option of participating in the pilot process, which will be implemented with subsequent adoption processes. The pilot process will be address in detail in subsequent sections of this report.

DEVELOPING THE VISION

To develop the vision, the MRC immersed themselves in the Next Generation Science Standards Appendix D: "All Standards, All Students" which describes the role of institutionalized privilege in gatekeeping content and to demand increased cognitive expectations for all students in science and engineering. The group reviewed: longitudinal district data and the static nature of student achievement over time (also known as the achievement gap), the Edmonds School District Equity Policy, data on the diverse populations of students and their movements through science course pathways, the seven case studies who's findings were detailed in Appendix D, as well as the K-5 and 6-8 Science Vision Statements.

K-12 EDMONDS SCHOOL DISTRICT SCIENCE VISION STATEMENT

We believe that **everyone** should have access to a science education which challenges them to create solutions to authentic and complex problems. We can do this by:

- Eliminating systemic barriers based on race, gender, language, socioeconomic status, and/or (dis)abilities.
- Fostering each student's development into a global citizen, rather than an elite opportunity for some.
- Identifying and eliminating any practices that interfere with academic achievement for any students' racial or ethnic group compared to their peers. (Board policy 0600)
- Intentionally seeking and including students' multiple racial and ethnic perspectives when engaging in science. (Board policy 0600)
- Ensuring a positive and academically rigorous science learning environment that engages each and every student. (Board policy 0600)
- Inviting and including community members and corporate partners to bring multiple perspectives that reflect student backgrounds.

Teachers facilitate science learning through:

- The Next Generation Science Standards that are based on authentic, locally sourced phenomena
- Making student learning relevant through identifying STEM careers that relate to student interests
- Shifting the teacher's role from science expert to facilitator
- Facilitating student discourse that builds conceptual understanding
- Leveraging technology to enhance student learning and products
- Making explicit connections between content learning and real world application
- Anchoring phenomena to an essential question that leads into a coherent storyline
- Integrate often siloed subject areas to deepen students learning experiences

Students experience science learning through:

- Phenomena that allows them to build upon their current understanding of the world around them
- Utilizing 21st century skills such as critical thinking, creative problem solving, communication, and collaboration.
- Engage in hands-on labs and engineering design to unpack the phenomena and provide evidence and reasoning for their thinking
- Investigate the world around them in order to explain phenomena and use their scientific understanding to design solutions to problems.
- Seeing themselves reflected in their science learning while recognizing the institutional biases toward race, gender, language, socioeconomic status
- Increased ownership of learning (student voice and choice)
- Students do authentic work of scientists and engineers, explicitly seeing themselves in those roles and understanding what that entails.

TIMELINE OF SCIENCE ADOPTION EVENTS

High School Science Adoption Timelines						
School Year	**2018- 2019**					
	January 2019	**February 2019**	**March 2019**	**April 2019**	**May 2019**	**June 2019**
Administration And Staff Communications and Events	**January**, *Administration* and Staff Communication of Adoption Intent	**February 1,** *Staff and Administrators*, Communication of adoption calendar, timelines, and committee opportunities **February 25- March 15,** *Science Teachers and Staff*, Needs Assessment Conducted	**March 7,** Review committee team members selected		**May 30** *Staff:* Update on Potentials Materials Pending Review	
Materials Review Committee/Content Area Meetings			**March 14,** *Review Committee: Equity in Science, Development of K-12 Science Vision* **March 20**, *Review Committee*: Develops scoring rubrics **March 21**, *Review Committee:* Calibrates Scoring of Rubric **March – June** *Content Teachers and Review Committee*: Curricula Review		May 30, *Review Committee:* Update on Materials	**June 7 and 10**, *Content Teachers and Review Committee*: Evaluates curriculum using scoring rubrics **June 24** *Review Committee*: Reviews rubric data and selects final materials to pilot
Community and Staff Input Events			*Site Based Needs Assessment and Criteria Drafting* March 6: MTH March 7: MDH March 11: EWH March 12: SLH March 15:LHS			
PEC, IMC, and School Board Updates	IMC January 22			PEC April 23 IMC April 30		

High School Science Adoption Timelines							
School Year	**2019-2020**						
	September 2019	**October 2019**	**November 2019**	**December 2019**	**January 2020**	**February 2020**	**March- June 2020**
Administration And Staff Communications and Events	**September,** *Staff and Administrators*, Communication of adoption calendar, Science Job Alike, timelines, and committee events				**September,** *Staff and Administrators*, Communication of adoption calendar, Science Job Alike, timelines, and committee events		**Hold on All Adoption Events to Support Students and Teachers with Remote Learning**
Materials Review Committee/Content Area Meetings	**September 18 and 20**, *Pilot Committee,* Training on McGraw Hill, Inspire Science	**October 19** *ALL Science Job-Alike, Update on Materials in Review and Probeware/Hardware Needs Assessment*		**December 10**,*Pilot Committee:* Training on BFW Living By Chemistry and Curriculum Mapping		**February 27**, *Pilot Committee,* Training on Sapling Plus Accounts BFW Living By Chemistry	
		Piloting Window 1: October – November for Inspire			Piloting Widow 2: January- March for Living by Chemistry		
Community and Staff Input Events		Science Laboratory Inventory, Science Materials Needs Assessment and Initial Probeware List Development (all Science Staff)					
		October 23 Community Bias Screener Input and Science Focus Group					
PEC, IMC, and School Board Updates		IMC October 8 PEC October 17	IMC November 5		IMC January 14 PEC January 22	IMC February 11	IMC March 10

High School Science Adoption Timelines										
School Year	**2020-2021**									
Month	**September 2020**	**October 2020**	**November 2020**	**December 2020**	**January 2021**	**February 2021**	**March 2021**	**April 2021**	**May 2021**	**June 2021**
Administration And Staff Communications and Events	**September,** *Staff and Administrators*, Communication Adoption Hold and Science Job Alike	**Hold on All Adoption Events to Support Students and Teachers with Remote Learning and Transition to Simultaneous Instruction**				**Feb 17** *Chemistry Staff Update*	**March** *Staff* Communication of adoption calendar, timelines, and committee events for Science Probeware/Hardware	**April** *Staff* Communication of adoption calendar, timelines, and committee events for 2021-2022 and Chemistry		
Materials Review Committee/Content Area Meetings	**September 2**, All Science Staff Job-Alike					Feb 17 *Chemistry Staff* Update on Adoption Process	**March 8,** *Department Chairs* Hardware/Probeware Needs Finalized		**May 5** Chemistry Committee Update **May 12** Chemistry Teacher Feedback **May 25** Chemistry Final Feedback	
Community and Staff Input Events						Public Online Chemistry Community Review/Feedback Window 1 May 15-25, Window 2				
PEC, IMC, and School Board Updates				PEC December 1	IMC Jan 12	PEC Feb 18	IMC March 9	PEC April 21 IMC April 27	IMC May 11 PEC May 20	IMC June 8 *School Board* Reading 1 June 8 *School Board* Reading 2 June 22

MATERIALS REVIEW PROCESS

DEVELOPING THE SCIENCE EVALUATION RUBRIC

The Materials Review Committee used two guiding documents to develop the science evaluation rubric. Both documents are recommended by Achieve to evaluate NGSS 3-Dimensional alignment and are the keystone tools that states and districts have used to evaluate instructional materials.

The first guiding document was designed for intense unit level evaluation, called the *Educators Evaluating the Quality of Instructional Products (EQuIP) Rubric.* The EQuIP Rubric provides criteria by which to measure the alignment and overall quality of lessons and units with respect to the Next Generation Science Standards (NGSS). The purpose of the Rubric is to (1) review existing lessons and units to determine what revisions are needed; (2) provide constructive criterion-based feedback and suggestions for improvement to developers; (3) identify examples/models for teachers' use within and across states; and (4) to inform the development of new lessons, units, and other instructional materials. The second guiding document was the *Primary Evaluation of Essential Criteria for NGSS Instructional Materials Design* Rubric (PEEC Rubric). This resource is a curricular program level tool that seeks to focus educators and curriculum developers on the critical innovations within the NGSS and dig deeply into materials to (1) evaluate the presence of those innovations and (2) answer the question *"How thoroughly are these science instructional materials designed for the NGSS?*

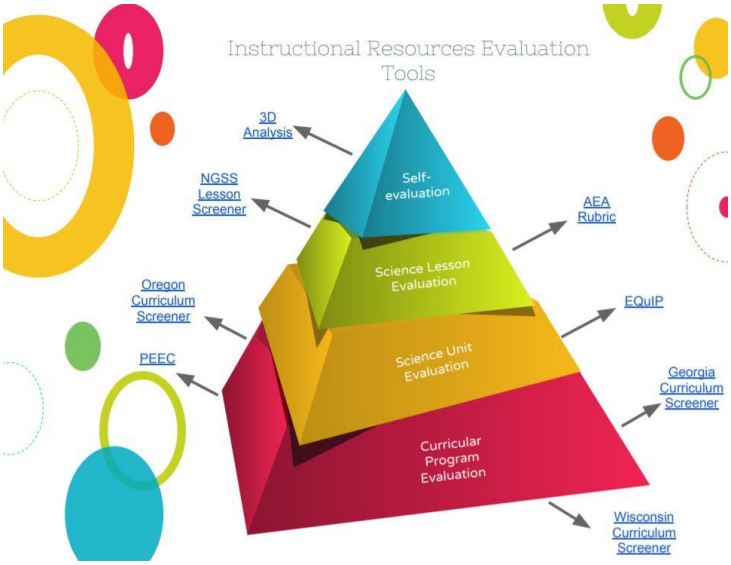


Figure 6: Levels of Instructional Resource Evaluation tools utilized in the Materials review rubric development process, Image from iowacore.gov

In addition to these main guiding documents, the science leads also provided the committee with modified EQUIP and PEEC rubrics developed by the following NGSS early adopter states: Ohio, Georgia, Wisconsin, and Oregon. These states also utilize statewide Science adoption criteria to assist districts in evaluating instructional programs for science. Materials Review Committee members selected key elements from the each of the rubrics in order to develop the Edmonds School District Science Curriculum Evaluation Rubric (Appendix II)

A seven category rubric was developed with a total of 52 criteria. The categories to evaluate the curricular options include: Category A: NGSS 3-Dimensional Design, Category B: Student Engagement, Category C: Monitoring Student Progress, Category D: Instructional Supports, Category E: Technology and Materials, Category F: Differentiated Instruction, and Category G: Bias.

We utilized a coefficient of 2 to weigh the importance of Category A: NGSS 3-Dimenional Design, in comparison to categories B-F. Category A was heavily modeled after the EQUIP and PEEC rubrics, assessing the strength of NGSS alignment and intentionality of NGSS design. Category A was also considered the highest validation point in the process, as committee members would not proceed to Categories B-G if the Category A Total did not meet the threshold requirement (scoring above 12 and each criteria is 3 or above). If materials scored a 2 or below in one criteria only, specific evidence must be cited and will be collectively evaluated by the committee. It is a requirement

of that materials be designed or strongly aligned to NGSS, so materials would not be considered if the validation point was not reached. For consistency in scoring and inter-rater reliability, criteria descriptors for each criteria score were composed. Rubric validation and scoring training was conducted with the Materials Review Committee early on in our process (see timeline for specific dates).

For scoring in Categories B-F, committee members used a 4 point scale evaluating each criteria. A score of 4 indicates a high degree of NGSS alignment and a score of 1 indicates traditional, non-NGSS aligned materials.

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Table 2: Scoring Criteria for Rubric

After initial drafting of the rubric, Material Review Committee (MRC) members determined that an abbreviated system and scoring procedure needed to be implemented in order to simplify the process of scoring and evaluating curricula and to elevate the importance of guaranteed and viable access to curriculum, equity of opportunity, and most importantly; culturally responsive teaching. Each Category has culturally responsive teaching practices embedded in at least one criteria. Criteria were limited to 5 in each category of high importance, as defined by the needs assessment and vision: Differentiated Instruction (Category F) and Instructional Supports for Students (Category D). Categories B, C, and E (Student Engagement, Progress Monitoring/Assessment, and Technology Access) were limited to 4 or fewer. Each category was coded for ease of reference during the recommendation process.

In order to prepare teachers for the evaluation of NGSS Alignment, the MRC calibrated the rubric using exemplary NGSS Designed Curriculum, inquiryHub Biology, an Open Educational Resource course developed by the University of Colorado and Denver Public Schools. InquiryHub Biology received an NGSS Design Badge in 2019. According to the nextgenscience.org website, to earn this digital badge, “instructional materials must be reviewed either by NextGenScience (for proprietary materials or materials in development) or its Science Peer Review Panel (for free and publicly available materials) and earn the highest rating on the EQuIP Rubric for Science. The EQuIP Rubric for Science provides criteria for measuring the degree to which lessons and units are designed for the NGSS. The highest rating, “E: Example of high-quality NGSS design,” indicates a high-quality design for the NGSS across all three categories of the EQuIP Rubric: I) NGSS 3D Design, II) NGSS Instructional Supports, and III) Monitoring NGSS Student Progress. Achieve coordinated the development of the EQuIP Rubric for Science after facilitating the development of the NGSS, and the rubric has widespread adoption in the field.” After calibrating the MRC developed rubric to the EQuIP rubric and subsequent review of the materials, the MRC was able to score the inquiryHub Biology curriculum at 160/160 due to alignment, embedded culturally responsive teaching practices, and explicit supports for student learning in a rigorous discourse based inquiry curriculum. The committee determined that 140/160 would be the minimum threshold for moving curriculum to the pilot stage of the review process, sharing the threshold previously established at 3 or higher per criteria.

INITIAL MATERIALS EVALUATION USING RUBRIC CATEGORY A

The following curricula were eliminated due to Category A scores below threshold: Mastering Chemistry by Pearson, and Active Chemistry by Activate Learning.

Mastering Chemistry by Pearson Rationale: Materials are not aligned or weakly aligned to the 3-Dimensions of NGSS. This is a non-negotiable criteria. In addition, teachers have provided feedback that the Pearson platform is challenging to navigate and that there is a lack of varied professional development opportunities (based on currently adopted materials within the district). Pearson was recently acquired by Savvas, and updated materials have not been finalized for release at this time.

Active Chemistry by Activate Learning Rationale: Materials are not aligned or weakly aligned to the 3-Dimensions of NGSS. This is a non-negotiable criteria. Aged content and relevancy of topic arrangement and phenomena is largest concern.

Publisher	Title	Selected for Full Review
McGraw Hill	Inspire Chemistry	**X**
Activate Learning	Active Chemistry	
HMH Science Dimensions	HMH Science Dimensions Chemistry	**X**
Accelerate Learning	STEMscopes	**X**
Bedford Freeman Worth	Living By Chemistry	**X**
Pearson	Mastering Chemistry	
Cengage	Chemistry (Zumdahl 2018)	**X**

Table 3: Curriculum Materials Selected for Full Review

MATERIALS EVALUATION USING FULL RUBRIC

The following materials were selected for a full scale review using the developed rubric, despite some questions regarding actual alignment to NGSS: HMH Science Dimensions Chemistry, STEMScopes, and Introduction to Chemistry by Cengage, Living by Chemistry, and Inspire Science. Both MRC and content teachers reviewed

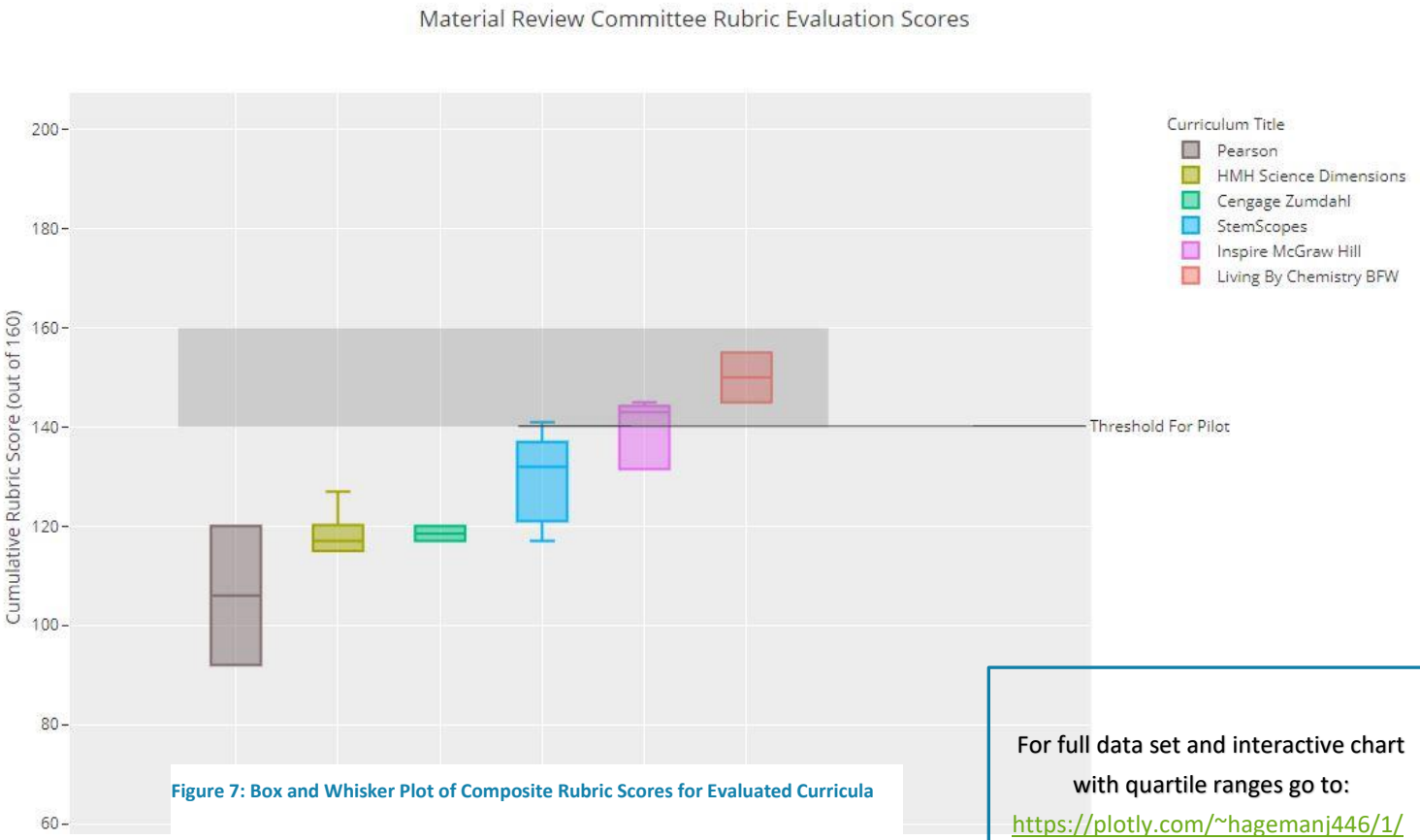


Figure 7: Box and Whisker Plot of Composite Rubric Scores for Evaluated Curricula

For full data set and interactive chart with quartile ranges go to: https://plotly.com/~hagemanj446/1/

materials with the full rubric. The box and whisker plot of composite rubric scores is shown above (full view) and below (zoom).

Material	Min	Median	Max
Stem Scopes	117	132	141
Pearson	92	106	120
McGraw Hill	131.5	143	145
Cengage	117	118.5	120
HMH Science	115	117	127
Living By Chemistry	145	150	155

Table 4: Distribution of Composite Rubric Scores for Reviewed Materials

RATIONALE FOR ELIMINATION

The following curricula did not meet the threshold composite score of 140/160 on the evaluation rubric and had median composite scores of 106 (Pearson), 117 (HMH Science Dimensions), 118.5 (Cengage, Zumdahl), and 132 (STEMscopes). McGraw Hill Inspire Science series had a low composite score of 132.5 and high of 145 with a median of 143. Living by Chemistry's composite score range fell between 145 and 155 with a median score of 150. Living by Chemistry had overall higher inter-rater reliability in rubric scores as evidenced on the box and whisker data plat.

Based on rubric scoring, teachers summarized their findings into the following rationale for elimination.

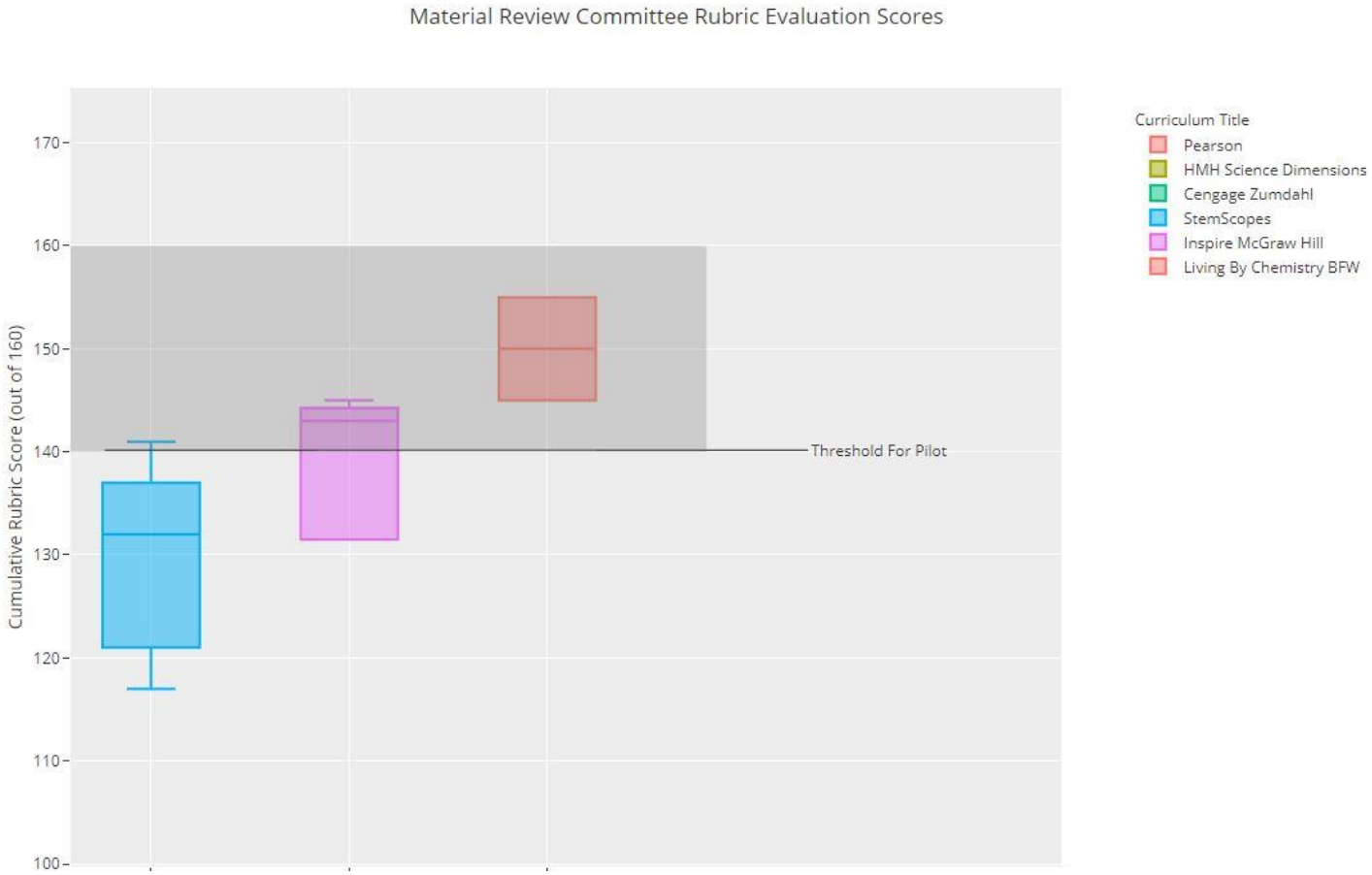


Figure 8: Box and Whisker Plot of Composite Rubric Scores for Evaluated Curricula, Zoomed View

STEMScopes Rationale: StemScopes was eliminated early in the process for Chemistry for lack of rigor and coverage of the breadth of physical science/ chemistry DCI's, even for general chemistry and Physical science course. The committee felt the phenomena were relevant to most students, but over utilized hooks versus true phenomena and contained fractured learning as opposed to a coherent storyline. Teachers and review committee felt there would need to be too much supplementation to make this a meaningful core curriculum for students, and near impossible to supplement for Honors.

HMH Science Dimensions Rationale: No districts within our region have adopted HMH Science Dimensions or have indicated that this publisher is a finalist for piloting purposes. However it was developed using the Equip rubric and contained promising phenomena. The challenge with this curriculum was the platform, and the fact we receive California standard edition materials to review. The National edition had not been released at time of review and was not finalized. This is a slightly integrated curriculum and would fit in well with a district utilizing the entire suite of HMH materials for their integrated course sequencing in high school, but the inability to review all course materials for the purchasing edition prevented the committee from recommending it for piloting.

Introduction to Chemistry (Zumdahl) by Cengage Rationale: The newest and reviewed edition (2018) was identical to our current core curriculum, adopted in 2005. NGSS alignment was not present. Teachers and MRC remarked that the website, digital materials, customer service, teacher support and professional development provided by Cengage were lackluster and in need of improvement.

PILOT PROCESS

The Materials Review and Student Learning Team recommended that Inspire Science be piloted in classrooms followed by Living By Chemistry and that detailed feedback and reviews be conducted on NGSS alignment. The Inspire Science series was the first curriculum to pilot due to the intentionality of the scope and sequences across integrated science domains (content areas) and shared pedagogical methods that would allow for integration. The pilot window for this curriculum would occur from late September to early November with a staggered approach to implementation for multiple content areas.

The pilot window for Living by Chemistry would extend from February to March, allowing teachers to transition students between semesters and ensure that piloting curriculum would not impact student achievement or teacher workload during intensive grading periods.

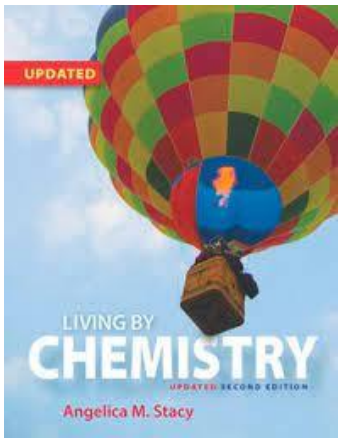


Figure 9: Textbook Covers of Piloted Curricula

PILOT IMPLEMENTATION, AND EVALUATION OF CURRICULA

Our goal is that the pilot committee should consist of a variety of teachers to represent the breadth of educators in the Edmonds School District: from those in their beginning years of teaching to more than 20 years of experience, experience teaching in Edmonds or surrounding districts and states, and multiple demographics. However, the teachers in these courses are all definitive teacher leaders with similar years of experience teaching science and demographics, as our high school science teacher pool is not racially diverse. Teacher's student groups were varied to include sections/classes with high percentages of English Language Learners or students with special needs including IEPs and/or 504 plans as well as general education students at various school sites.

During the 6-8 science adoption, teachers implemented a minimum of 5-7 lessons (from 3-7 days) within a 2 week time period. It was determined after that process that a) the number of lessons was too few to determine storyline coherence and b) that specific routines (unit phenomena launch, how students develop causal understanding over time, argumentation practices) and assessments need to be piloted. Therefore for the High School adoption, the minimum number of lessons was dropped and the pilot window extended to 4-6 weeks. At the close of each unit, teachers evaluated the materials based on their experience utilizing the curriculum in the classroom and indicated feedback and evidence on the Evaluation Rubrics.

INSPIRE SCIENCE PILOT

A total of 11 teachers elected to pilot the Inspire Science curricula materials and received training on the platform and material usage on September 18th and 20th, 2019. Pilot teachers were able to choose from the following implementation methods: 1) individual choice of unit, 2) units that target specific standards that fit into the scope of current curriculum. Majority of teachers chose option two and were provided with one full release day to plan instruction collaboratively and map out scope and sequence changes and adjustments for students. The pilot window was open from end of September through November with feedback deadlines by November 15th for MRC review in December. Teachers made the determination to stagger start dates for content areas to allow for co planning and to prevent teachers with multiple preps from having to learn and pilot 2 new curricula. Biology and Earth Space Science teachers elected to go at the start of the window (October) followed by Chemistry teachers (November).

INSPIRE SCIENCE PILOT TEACHER FEEDBACK

Although there are many qualitative data points that could be presented, the descriptive feedback from the pilot teachers is most impactful in regards to understanding the shortcomings of the piloted curricula. Teachers indicated that the units were not aligned with the content standards. Only lesson 1 of 4 addressed content standards and the phenomena topic was not carried over via storylines and that the storylines lacked relevancy and were not place based (Pacific Northwest Region). The packaging of the storylines, which should be the strength of the curriculum was determined to be the weakest point.

"It tried to weave story lines with a textbook format-- unsuccessfully. A textbook is typically linear. It groups related topics into units and chapters. A curriculum based on a story line uses the essential question to anchor student learning. What a student needs to know to answer the essential question may bounce between units and chapters within a textbook. It attempted to use storylines, but overlaid them into a traditional textbook. The result was weak (connections weren't made, no looping back, focus questions unanswered and week engagement in essential question)."

"This is a medium to strong digital textbook with lab ideas. It is not a curriculum. If you taught it directly it would not meet the needs of all students."

Teachers were also frustrated with the online platform which appeared as if not beta tested yet, as there were many dead-end links, mislabels and redirects on the site. Grading was considered "clunky" as teachers had to export .cvs files for upload into Canvas or hand enter grades into Skyward. Our high school science teachers were early adopters of the Canvas LMS, and were hoping to have streamlined grading features.

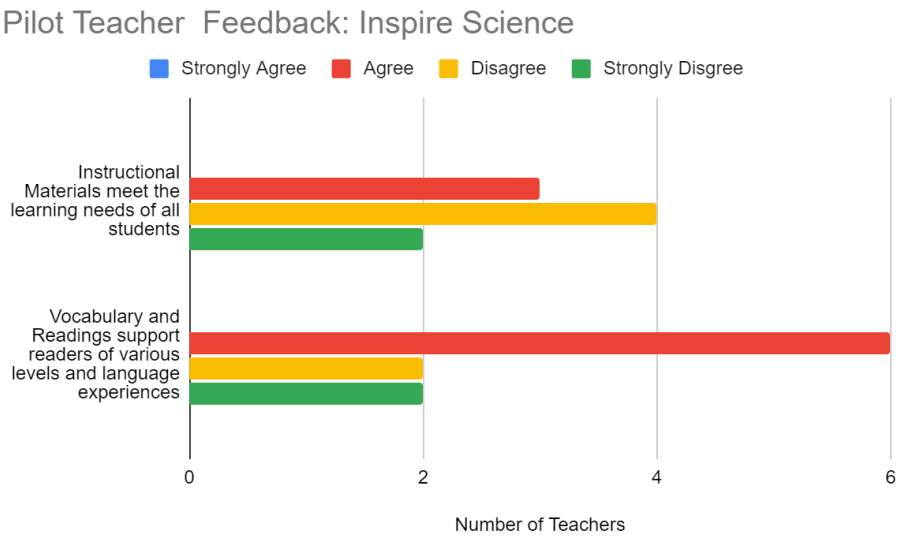


Figure 10: Pilot Teacher Feedback on Instructional Supports for the Inspire Science Curriculum

The fact that the digital materials (e-book, English/Spanish translations, simulations, videos, etc.) were all housed in a closed system interface, external plugins and applications such as Google Translate and Google Read+Write were not able to be used to support student learning. While the internally available materials were able to support those students proficient in Spanish, no other language resources were available. For this reason 40% of teachers disagreed or strongly disagreed that the curriculum materials met students reading and language levels.

Due to the inaccessibility of materials for diverse learners and a weak through line for student understanding over time, teachers were not able to recommend this curriculum for use in the classroom at a majority vote of 60%. Based on this feedback and the unpolished quality of the digital platform, Chemistry teachers began their planning and mapping process to pilot the Inspire Chemistry curriculum, but found the materials to appear "retro fitted" to NGSS versus designed with intentionality around the standards. In that, the content of the lessons and chapters was not much different from what was available in the textbook currently in use, but layered on the pedagogical routines and science practices of NGSS in ways that seemed extraneous and did not support student understanding. The overarching questions and phenomena were not puzzling "What do plants and buildings have in common?" followed with the Lesson question "How can chemistry help you understand the world?" Chemistry teachers determined not to invest time into a full pilot of the curriculum and invest time into reviewing the subsequent materials and piloting the curriculum in full, voting as part of the 40% unsure in the graph below.

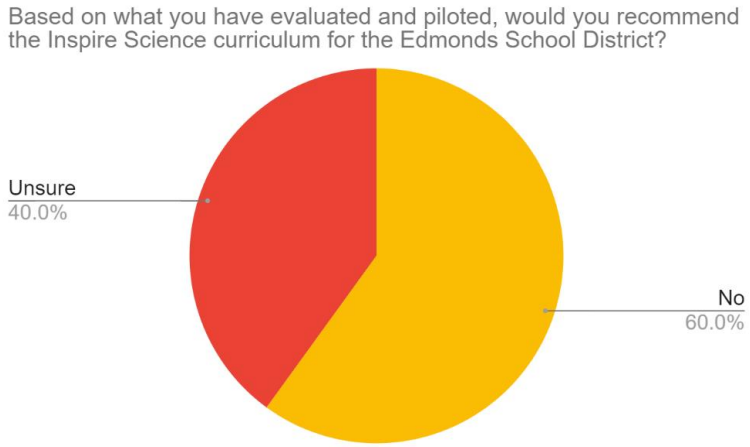


Figure 11: Final Pilot Teacher Feedback on Inspire Science Curriculum

STUDENT FEEDBACK FROM PILOT CLASSROOMS: INSPIRE SCIENCE

675 students at 3 schools and in three content areas participated in the Inspire Science pilot. 554 students submitted responses and feedback at the end of the pilot process. Students provided detailed feedback but struggled to describe how the curriculum storylines and phenomena were ambiguous. Students often described it as "learning objective unclear" or the topic/phenomena was not engaging. Students felt as though the experiments and design challenges were scripted and the laboratories were over structured and infrequent.

"More hands on work. There needs to be work where kids actually have freedom to say and test their ideas. The class and textbook didn't do that. The textbook was very mechanical and boring. It made the subject seem like the least interesting thing I could learn about."

Although students piloted a variety of the features provided, the students did not find the materials specific to Inspire Science to support their learning. 53% found the videos to aid in their understanding and 44% of students highlighted the online dictionary and e-book as strong features. The key features that were promoted as accessible and universally accommodating: LearnSmart, SpongeLabs, and pre-translated Spanish texts were frequently used by less than 20% of students.

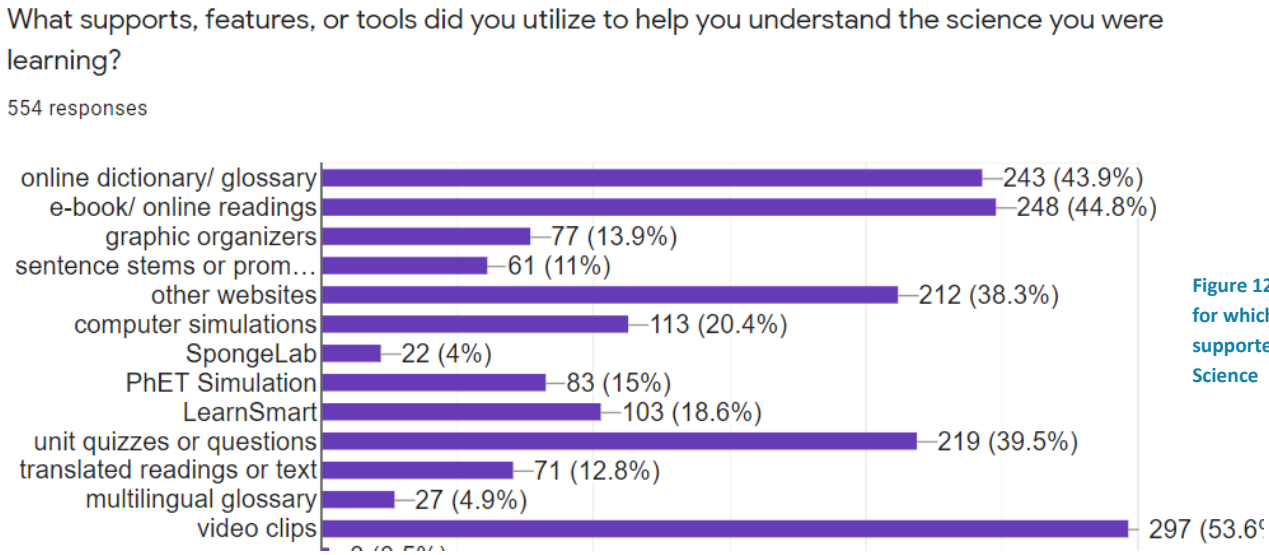


Figure 12: Student Indication for which materials best supported learning in Inspire Science

When asked if students would like to see other teachers in the Edmonds school district use this science curriculum, the majority were undecided at 53%. Based on the feedback from Pilot Teachers and students, the Materials Review Committee did not propose to recommend the Inspire Science curriculum for Earth Space Science, Biology, or Chemistry.

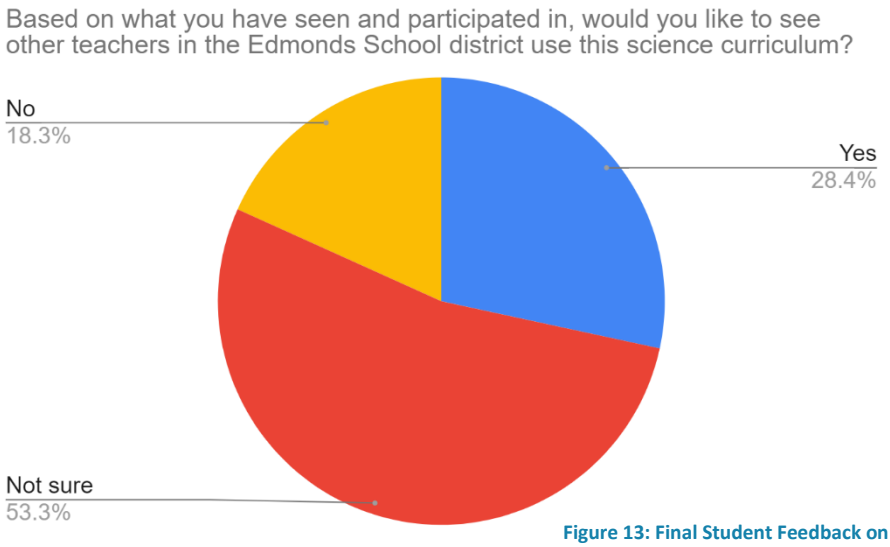


Figure 13: Final Student Feedback on Inspire Science Curriculum

LIVING BY CHEMISTRY PILOT

All chemistry teachers were given the opportunity to participate in the district pilot process for Living by Chemistry. A total of 4 teachers from 5 schools expressed interest in piloting and were invited to participate in the Pilot Committee. Teachers participated in Training on BFW Living By Chemistry curriculum on December 10th, 2019 and completed curriculum mapping and planning. Teachers divided the pilot into two parts: first utilizing the physical text resources and second to evaluate the online components. Teachers began using the materials in January and then received Training on Sapling Plus Accounts, BFW Living By Chemistry on February 27, 2020. Teachers began to use digital resources in March. The 175 students who participated in the pilot process completed 3 units: Weather (an integrated Physical Science unit), Toxicology, and Alchemy. The student feedback deadline was March 15, 2020. However, the piloting feedback and data collecting process was cut short due to our emergency COVID closure. One chemistry teacher was able to engage in a long term pilot of the curriculum materials from September 2020 to June 2021 with 65 students. The student feedback may be limited in number, but not scope and the Material Review Committee found it satisfactory in making a determination on recommending this curriculum.

STUDENT FEEDBACK FROM THE PILOT CLASSROOMS: LIVING BY CHEMISTRY

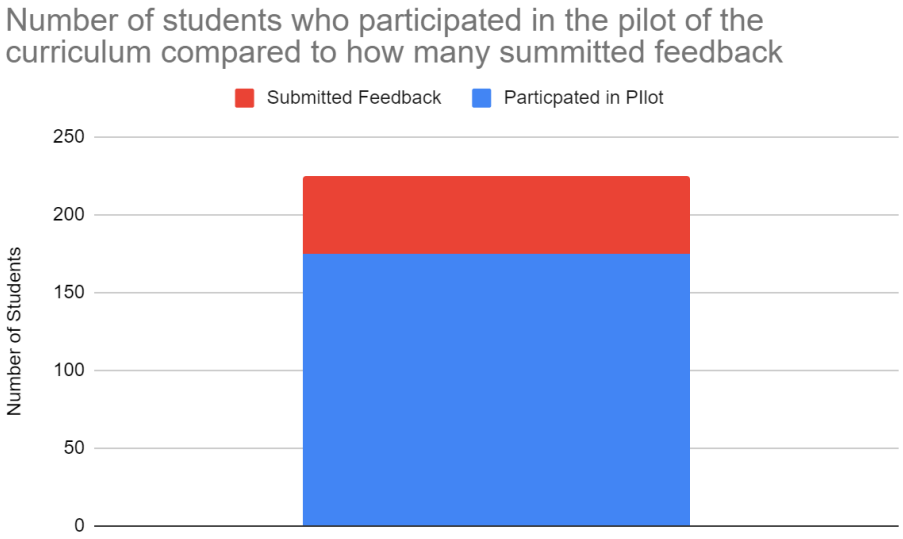
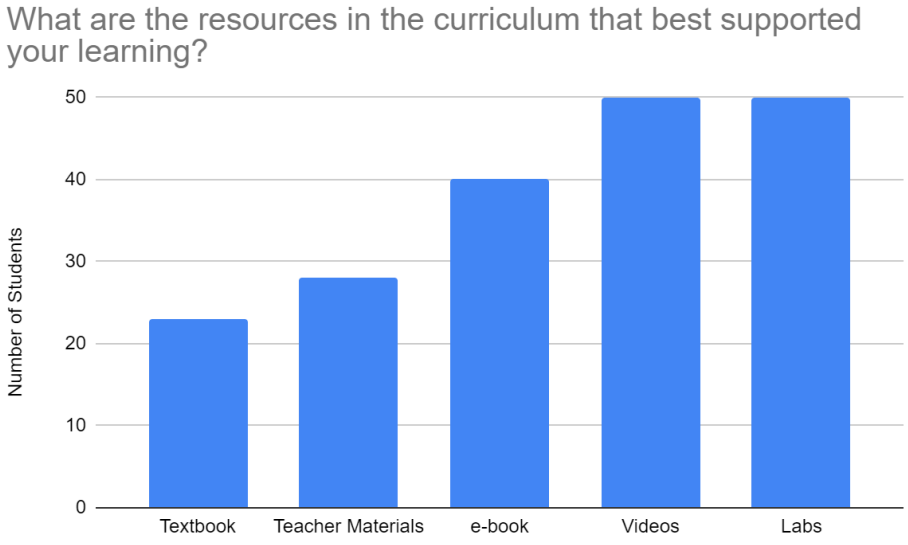


Figure 14: Student Participation in Pilot and Feedback Responses Given for Living By Chemistry



At the close of each pilot period, students were asked to provide feedback on their experiences and perception of the curriculum materials via a Google Form. 175 students participated in the Living by Chemistry pilot at 2 sites. However due to the close of schools during the pandemic, only 50 out of 175 were able to submit feedback on the curriculum. These 50 students were enrolled in general chemistry. For scaling purposes, the total n is 50 students.

A majority of students identified laboratories, videos, and the digital textbook to be the elements of the curriculum that best supported their learning. Less than 50% of students indicated that the physical textbook was a tool that best supports their needs, which is in contrast to the perception provided by parents in the parent and community feedback survey. This mirrors the feedback received from students in the Inspire Science pilot. One difference is that

Figure 15: Student Indication for which materials best supported learning in Inspire Science

students felt this curriculum contained more laboratories and hands on experience than indicated in the Inspire Science pilot.

All students who submitted feedback indicated that the curriculum covered content that they found important and 76% found that the materials addressed their learning needs. Overall, 92% of students (46 out of 50) indicated that they would like to see this curriculum being used in the Edmonds School District chemistry classroom. 4 indicated that they were unsure, with no rationale and there were not any no responses (see Figure 17).

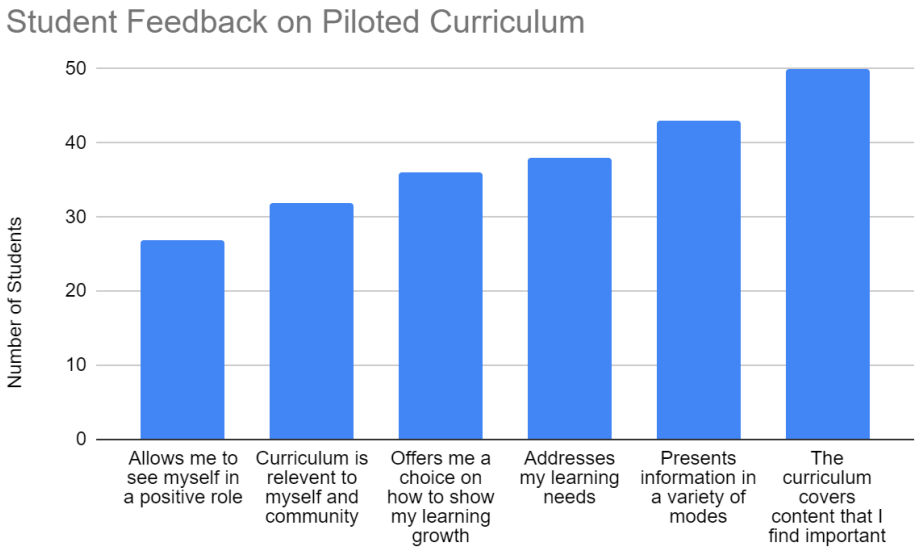


Figure 16: Student Perspective on Relevancy and content coverage in Living by Chemistry curriculum

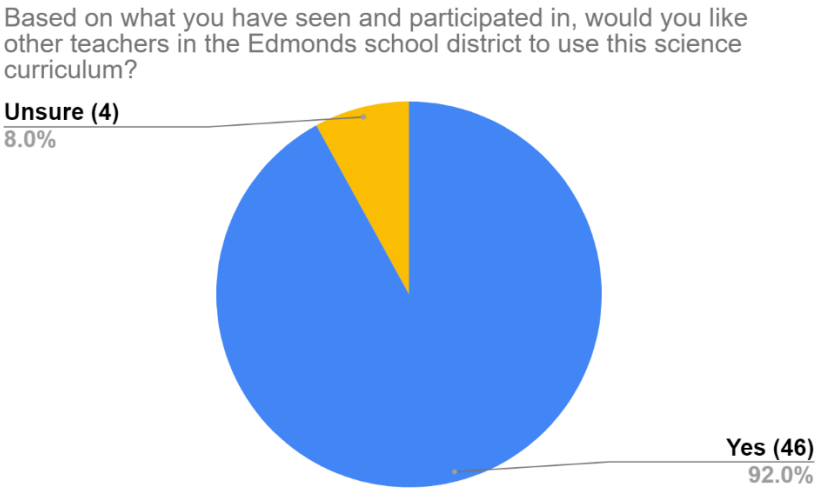


Figure 17: Final Student Feedback on Living by Chemistry Curriculum

DATA REVIEW AND DEVELOPING THE RECOMMENDATION

After the pilot, all of the committees (Materials Review, Pilot, and Content Teachers) reconvened to review the suite of data in spring 2021. During this meeting, it was determined that one final and exhaustive push for feedback was necessary to allow for community and parent perspective on the curriculum. Details on this are outlined in the

Parent and Community Feedback Section. The curriculum highlights that elevated the Living by Chemistry curriculum were in regards to the content topics within the units and the phenomena approach which had clear storylines. Teachers then discussed the features that supported students in simultaneous learning. The list of includes:

- Full Canvas Deep Integration
  - E-book App embedded into left bar menu of Canvas Navigation
  - Grading and Assessment directly sync to Skyward
  - Available Sandbox and templates to build into current course/modules
- Sapling Learning Systems
  - E-book and digital learning support embed into Canvas
  - Allow for translation app and Google Read+Write
- Computerized Adaptive Testing and Assessment Item Banks
  - Exam View Item Banks with levels pre-chem to college chem
- Assessment Analytics and Item Filters
- Engineering Design Challenges

Teacher feedback indicated that the Living by Chemistry materials are an appropriate baseline knowledge for ALL students in chemistry and that it is best suited for students in the general education chemistry setting, while providing access to students who may find chemistry a challenging subject area to master. And had the following to say:

"We can use this material to teach chemistry. That it is not able to check all the boxes that individual teachers may have does not mean it is not the best curriculum at this time."

"It is the only NGSS chemistry textbook available that meets a majority of our needs as defined by the needs assessment>"

"I have used the LBC materials for almost all of remote/hybrid learning this year. Though limited in what I was able to teach, I found the material/text accessible for gen chem students to use. It is at an appropriate level for gen chem / physical science students."

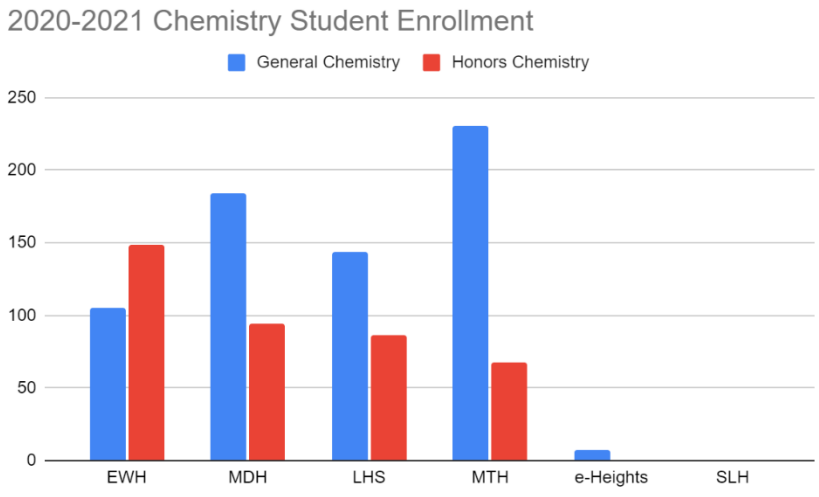


Figure 18: Edmonds School District Chemistry and Honors Chemistry Enrollment by school site

The figure on the left shows the Edmonds School District 2020-2021 Chemistry enrollment for Honors and General Chemistry. One important comment that was made is that Scriber Lake High School does not usually offer chemistry to students as it has been challenging course for students furthest from educational justice. Our department chair at SLH indicated that with accessible materials and the simplified reading level found in the text, plus the integrated and engaging units, that the general chemistry course would likely be able to be offered to students. As shown in figure 18, our general chemistry courses are more diverse than our Honors Chemistry courses based on student demographics. When asked to vote, 11 teachers (Material Review Committee and Content Teachers) participated

and 2 abstained. 9 teachers (90%) agreed that the curriculum would best suit the needs of our general chemistry students, 2 abstained but agreed to commit to the implementation process but did not vote or participate in the process, and one teacher (10%) disagreed. The teacher who disagreed did not feel as though the curriculum would best suit the needs of the Honors Chemistry students to prepare them for AP Chemistry and college level STEM courses. The teacher did agree that this would best fit general chemistry student's needs, but not as a curriculum intended for district wide use in all courses as there would need to be heavy supplementation for Honors students. This sentiment was echoed by a few parents in the Parent and Community Feedback (see section). This feedback is addressed at more length in the Rigor section of Expected Challenges.

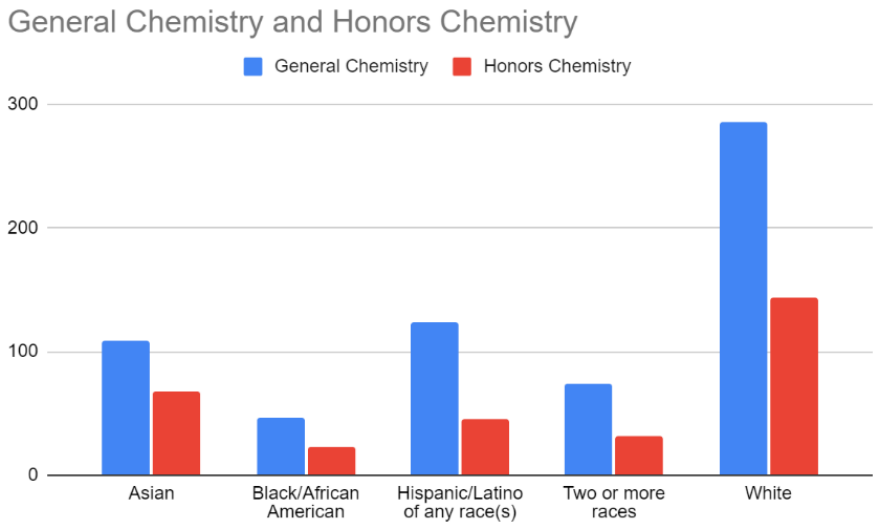


Figure 19: Student Demographics of General and Honors Chemistry courses

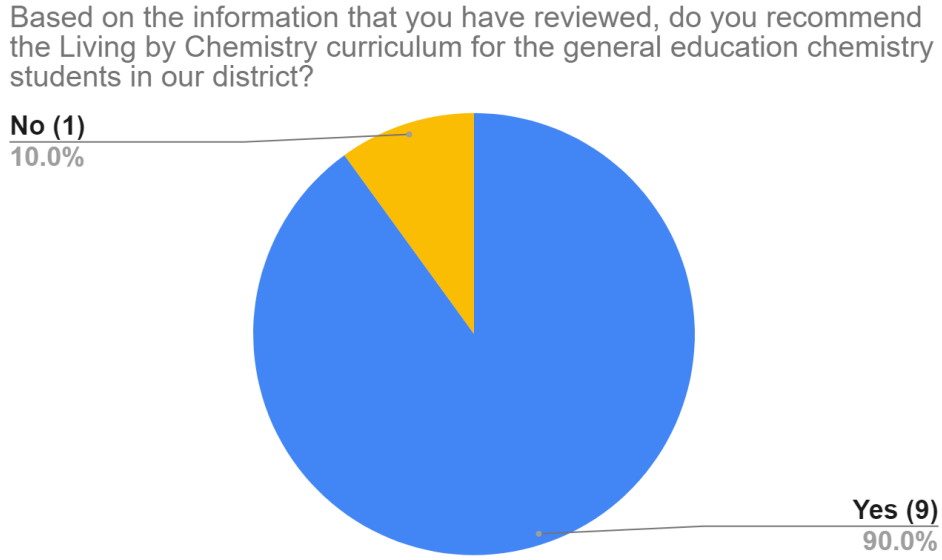


Figure 20: Final Material Review Committee and Content Area Teacher Feedback Vote

Based on our evaluation of the challenges expected and feedback provided, the Material Review Committee and content teachers recommend, by majority, adopting the Living By Science instructional materials for general chemistry.

BIAS AND ACCESSIBILITY SCREEENING

Living by Chemistry is approved by the National Instructional Materials Access Center (NIMAC) for alignment to the National Instructional Materials Accessibility Standards for the textbook that we recommend for adoption. The goal of NIMAS is to have high-quality consistent source materials in specialized formats for students with print disabilities to be able to access the curriculum. Our planned professional development will include identifying strategies on how to utilize resources to meet the needs of diverse learners. Category G, the Bias Screening Tool was carried over from past adoptions, pursuant to ESD Board Policy 2020P: Instructional materials shall be free of bias pertaining to sex, race, creed, religion, color, national origin, honorably discharged veteran or military status, sexual orientation including gender expression or identity, the presence of any sensory, mental, or physical disability, or the use of a trained dog guide or service animal.

This bias screening, however, focuses on identifying stereotypes (in images and in text) and does not address the curriculum's cultural relevancy or presence of culturally responsive pedagogy. The MRC utilized OSPI's Model Resource: Screening for Biased Content in Instructional materials to review the content contained in this recommended text. It is recommended that a detailed procedure be developed with the Department of Equity and Outreach to identify areas in need of improvement in the adopted curriculum and that all stakeholders are invited to participate in the development of the screening tool. Part of our rubric development process was to ensure that high impact culturally responsible practices were embedded into our scoring criteria in each category to ensure that these elements were present in all categories in order to promote the identification of materials that provide equitable access to high quality science education and achievement outcomes for ALL students.

PARENT, FAMILY, AND COMMUNITY FEEDBACK

In this science adoption process, our goal was to include student, parent, family, and community voice in each part of our process, as we have underutilized these groups historically. In the past one or two Curriculum Review nights have been held at the ESC. For the K-5 and 6-8 Science adoption processes, it was found that the most effective option for previewing curriculum and providing feedback was the online review process. In order to ensure that the curriculum was both relevant and culturally responsive, a community focus group meeting was held on October 23rd, 2019. The purpose was to develop community input regarding our current Bias Screener and to begin a Science Focus Group. The Science Community Focus Group had 5 community/parent attendees and we hope to grow this committee to evaluate our curricula over time. Part of this group's work was the development of the integrated feedback tool that will be utilized in our Biology, Physical Science, and Earth Space Science Curriculum Development process. The first draft is below and includes evaluation of the Living by Chemistry materials.

High School Science Curriculum Evidence Based Feedback Form

Washington State adopted the Next Generation Science Standards in October 2013, also known as the Washington State Science Learning Standards (WSSLS 2013). "The NGSS Innovations are the five most significant ways the NGSS advance science teaching and learning, when compared to previous standards and typical instructional and curricular practice in American schools." (source: Primary Evaluation of Essential Criteria (PEEC) for Next Generation Science Standards Instructional Materials Design)

NGSS Innovations:

1. Making Sense of Phenomena and Designing Solutions to Problems
2. Three Dimensional Learning and Assessment
3. Building K-12 Progressions
4. Alignment with English Language Arts and Mathematics
5. All Standards, All Students

Innovation 1: Making Sense of Phenomena and Designing Solutions to Problems

"By organizing instruction around phenomena, students are provided with a reason to learn (beyond acquiring information they are told they will later need) and shifts student focus from learning about a topic to figuring out why or how something happens. Additionally, the focus on relevant, engaging phenomena and design problems that students can access addresses diversity and equity considerations by providing opportunities for students to make connections with the content based on their own experiences and questions." (source: NGSS Innovations and Instructional Materials, 2017)

Phenomenon is relevant and meaningful to students.

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

Phenomenon offer an opportunity to explore historical racism (ex: Flint, Michigan Water issues, eugenics, etc.) **and the role of power, privilege and intuitional racism in the science fields.**

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

Feedback: No evidence that these topics were addressed in the chemistry curriculum. Supplementation could occur in the polarity unit engineering task when students are designing a water filtration system, especially in regards to Indigenous Water Rights, Flint Michigan water issues, or clean water and environmental justice topics.

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

Units are organized as a storyline, anchored by phenomenon or engineering problems that allow for students to build knowledge to explain the phenomenon or solve the engineering problem.

Instructional materials provide students with opportunities to consider the ethical implications of science (ex: gene modification)

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

Innovation 2: Three Dimensional Learning and Assessments

"Effective assessment of three dimensional science learning requires more than just a one to one mapping between the NGSS performance expectations and assessment tasks. It is important to note that more than one assessment task may be required to adequately assess students' mastery of some three dimensional targets, and any given assessment task may assess aspects of more than one performance expectation." (source: NGSS Innovations and Instructional Materials, 2017)

Students do the authentic work of scientists and engineers, explicitly seeing themselves in those roles and understanding what that entails.

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

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

The assessment system gives teachers clear artifacts of student learning progressions and understandings of the three dimensions through a variety of formal and informal formative and summative assessment items including performance tasks.

Innovation 5: All Standards, All Students

Instructional materials designed for the NGS provide opportunities for All learners and guidance to teachers for supporting diverse student groups, including students from economically disadvantaged backgrounds, students with special needs, English Learners, students from diverse racial and ethnic backgrounds, students with alternative education needs and accommodations, and gifted and talented students. They do so using a variety of approaches, but also ensure that features of NGSS design are intentionally leveraged to support diverse learners as they develop proficiency, agency, and identity in science. (source: NGSS Innovations and Instructional Materials, 2017)

Modifications and extensions for all students, including those performing above their grade level, to develop deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts.

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

Instructional Planning and Support

"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 and diverse society. The curriculum, instructional strategies, and materials and resources must engage a variety of learners using culturally responsive practices" (source: National Association for Gifted Children)

Uses diverse and inclusive instructional strategies in a logical progression of instruction that provide clear purposes for learning experiences (e.g., elicit preconceptions, teach new knowledge, build skills and abilities, connect to prior knowledge)

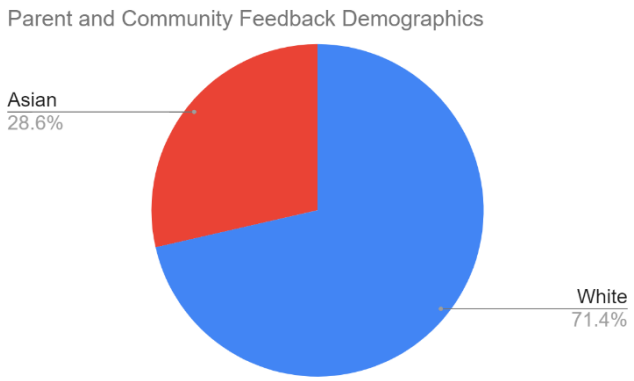
4	Superior Evidence
3	Strong Evidence
2	Moderate Evidence
1	Minimal Evidence
0	No Evidence

For this adoption, events were planned in March, April, and May of 2020 on designated Middle and High School Nights. Each middle and high school site was to be prepared with in person translators and childcare and open stations, a model that worked well for both the K-5 and 678 Science Adoption processes. The digital website was prepared as a supplement to these events in addition to the feedback form. As 2020 offered the challenge of the pandemic, a website was created showcasing informational videos, a tour of the online platforms, and a link to submit feedback via Google Forms. With the closure of school, momentum and communication about the process was lost to much more urgent and pressing needs. The curriculum review website was launched again in March 2021, just prior to teachers and students pivoting into the classroom for hybrid simultaneous instruction. Despite the length of time the site and feedback form was publicized and available for review, minimal feedback was obtained, as only one parent provided feedback. During the May 12th MRC and chemistry teacher meeting, it was determined that one final and exhaustive push for feedback was necessary to allow for community and parent perspective on the curriculum. The following methods were used to one final attempt for feedback:

- Peachjar flyer in English and Spanish to flyerboard
- Email announcement in English and Spanish to almost 13,000 Edmonds accounts with attached links and flyers
- Facebook, Twitter, and Instagram posts
- eNews article on the day the feedback forms closed

Although 12,955 accounts were pinged with flyers, announcements and posted to the external site only 9 individuals submitted a feedback form. The overall rate of return was 0.007%. The feedback from parents and students was minimal and we cannot draw concrete conclusions from such a small sample size. That being said, a brief analysis is provided.

Figure 21: Parent and Community Member Demographics from Feedback Responses



71.4% of parents identified themselves as white and 28.6% identified themselves as being of Asian descent, specifically Korean as indicated on the question in regards to racial identity. These are the highest proportionally represented groups in our chemistry courses, but this feedback does not represent the diversity of students who take chemistry nor the diversity of students in the Edmonds School District. 100% of parents agreed or strongly agreed that the science

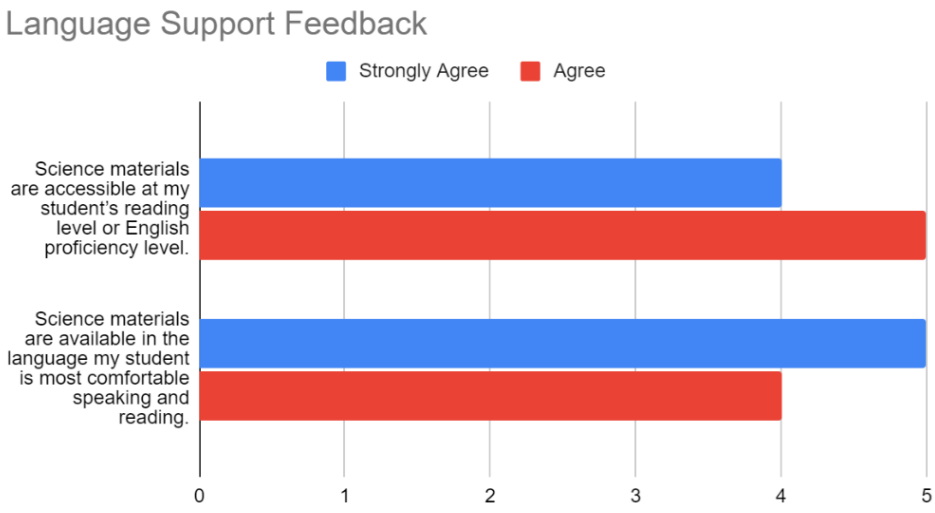


Figure 22: Parent Feedback on available Language Supports in curriculum

materials presented would be accessible to their student's reading and English language proficiency level, with two indicating that their students receive or have received services for English Language instruction. The same percentage also indicated that the materials were translatable and accessible in the language spoken at home.

The feedback on content and relevancy shows 8 of 9 parents agreed or strongly agreed that the content was relevant and important for their student and that their student would be engaged in age appropriate ways. A few parents indicated that their child also received accommodations with an IEP/504 plan.

Parents and community members determined the strength of the curriculum to be in three key areas:

1. Materials are an appropriate baseline knowledge for ALL students in chemistry
2. Curriculum is relevant to students lives
3. The organization of materials support student success

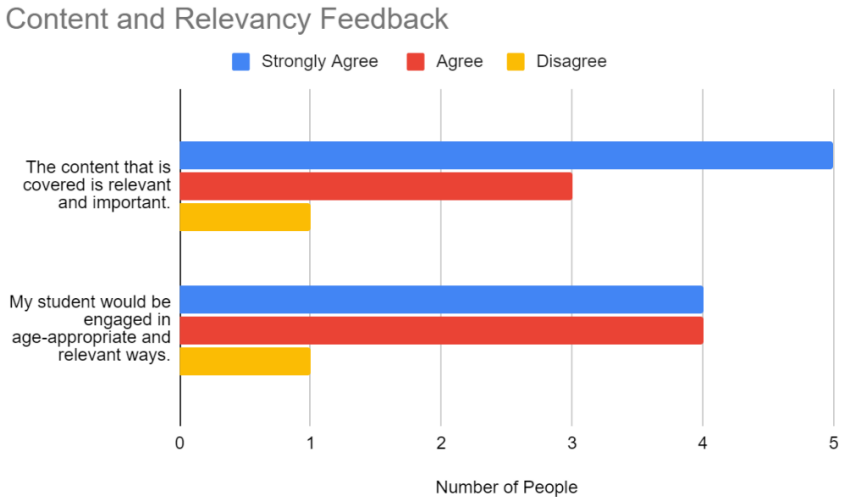


Figure 23: Parent Feedback on Content and Relevancy of Living by Chemistry Curriculum

"This curriculum provides a good baseline for my student to learn. I would like to see more in-depth materials in case that my student would like to drill down further in certain topics."

"Hands on experience and teach them how to take notes since they don't work with printed material. It is harder to locate information if one needs to go back if there are too many links or resources to check. The curriculum seems organized well and relevant, but it depends on the teacher how they choose to implement it and make it "fun" for the kids."

"My student loves anything that is hands-on. This would be a phenomenal curriculum for my student!."

"I don't think I have ever seen a better science curriculum. Since my children have been mainly homeschooled, I have reviewed a wide variety of curricula, and this one appears to be outstanding. If it is the one selected, I expect my son to take chemistry at…. in the 22/23 school year."

Critical Feedback on the curriculum fell within two categories. First was that physical materials and laboratories were not able to be reviewed by Parents or community member in the virtual setting, so it was not apparent to some that these would also be embedded or used in the classroom. Usually, we are able to set up a laboratory experiment or demonstration and showcase the physical and digital materials at our curriculum night events. This was not possible with our site limitations and COVID restrictions. It is the intent to provide physical textbooks and provide a variety of laboratory and hands on learning experiences for students. There is also a high frustration level with Digital Learning Components after varied remote learning experiences, and parents felt strongly that excellent teachers and hands on materials were of the utmost imperative. While the materials have an online component available, which syncs seamless with our Canvas LMS, it is not the only source available for teachers and students. The benefit of the digital text is that it is translatable, can be used with Google Read+Write and our accessibility tools, and can provide seamless accommodations for students in their personal learning environment. We acknowledge that this does not replace excellent instruction from teachers and the learning opportunities they cultivate.

"Online only doesn't work for my kids. They need hands on experiences when it comes to science, but having access to materials online helps with setting own pace."

"In person learning, actual hands on materials, books and teacher feedback should be a priority over online curriculum materials."

The second category was in regards to curriculum content and the target audience for the curriculum. There were some comments made in regards to the content and that it seemed watered down and would not prepare students for AP chemistry or college chemistry courses. Rigor is addressed in the "Expected Challenges" section of this report. It is important to note that this curriculum is designed to support all students in the understanding of chemistry and the NGSS physical science standards. The chemistry content and standards covered in the semester of chemistry found in the Physical Sciences course is similar to the general Chemistry course, the content expectations and standards address are different in Honors Chemistry. Honors Chemistry needs different supplementation to meet the entrance requirements of college and universities.

70% (7 parents) would recommend that this curriculum be taught in the general education chemistry classroom and 30% (3 parents) disagreed. The 30% who disagreed stated that the lack of rigor and expected content covered would not be sufficient for Honors Chemistry and to prepare students for AP Chemistry. The 70% of parents who agreed indicated that the materials were an excellent foundation for all students to demonstrate their knowledge of the physical sciences and chemistry.

Figure 24: Final Parent and Community Feedback on Living by Chemistry

While feedback was minimal, a majority of parents at 70% are in support of this recommendation and critical feedback is acknowledged and will be addressed.

Based on our evaluation of the challenges expected and feedback provided, we recommend adopting the Living By Science instructional materials for Chemistry.

IMPLEMENTATION PLAN AND PROJECTED COSTS FOR ON-GOING SUPPORT

Chemistry Implementation Plan				
Timeline	**Summer 2021**	**2021-2022 School Year**	**2022-2023 School Year**	**2023-2024 School Year**
Curriculum Implementation		All units of instruction	All units of instruction	All units of instruction
Professional Development Options (Required)	Option A) August Summer Institute (2 full days or 4 half day sessions)	Option B) September Release or After School	Option A) New Teachers (2 full days or 4 half day sessions) with same offerings as summer 2021	Option A) New Teachers (2 full days or 4 half day sessions) with same offerings as summer 2021
	Day 1 NGSS and Chemistry Session A) Historical Alchemy, Bonds and Matter (curriculum mapping and scope and sequence) Session B) Working through digital and physical tools/resources (Canvas and Sapling Learning) *Day 2 NGSS and Chemistry* Session C) Assessing Student Learning, Discourse, and Planning for Instructional Routines Session D) Collaborative and Individual Planning with support	Same Sessions offered over 2 full days or 4 after school sessions	Option B) Continuing Teachers 1 full day or 2 half day offerings Advancing Instructional Practices and Storyline Coherence	Option B) Continuing Teachers 1 full day or 2 half day offerings Advancing Instructional Practices and Storyline Coherence with Student Data
Professional Development Options (Optional)		Monthly After School Support Sessions Quarterly Curriculum Mapping and Scope and Sequence Revisions (Paid)	Monthly After School Support Sessions Quarterly Curriculum Mapping and Scope and Sequence Revisions (Paid)	Continuation of Scope and Sequence Revisions and needs depending on Turnover and New Teachers
Materials Processes and Distribution	Physical Textbook barcoding and distribution to sites Digital Materials Uploaded via Deep Integration in Canvas		Revised Digital Materials uploaded over Summer for September use	Revised Digital Materials uploaded over Summer for September use
Budget Estimates	First year implementation Professional Development Cost for 13 chemistry teachers based on current enrollment : **$14,900**		Implementation with 10% turnover estimate: **$6,000**	New Teacher Professional Development with 10% turnover estimate: **less than $500**
Total 3 year Professional Development Allocation Estimate = **$21,400**				

ADDITIONAL CONSIDERATIONS

Licensing:
BFW is offering an *eight year digital license*. In the past, science digital licenses were in much shorter duration (4-6 years) which created a continuous cycle of changing expectations due to the variable resources. In order to create guaranteed and viable curriculum and build teacher capacity for implementation of NGSS instruction, materials with extended licenses are preferable. There will be renewal options and updates to the Sapling Learning platform and Canvas Modules as materials are updated.

Author Background:
Dr. Angelica Stacy

- Committee member and designer of NGSS Physical science standards (physics and chemistry)
- Served on College Board Chemistry Development Committee to redesign AP Chemistry course and exam
- Designed Living By Chemistry as a precursor to AP and college chemistry courses

Canvas Deep Integration:
This curriculum is the ***only*** high school material reviewed to date that is fully compatible and integrated with the Canvas LMS. Sandbox courses and modules are available for teachers use, and all course materials, including digital book are applied to menu bar.

Additional Features to Note:

- English/Spanish visual glossary
- Translation can occur within browser
- Can use Google Read+Write Features
- Accessible for Screen Reading Technology
- Accessible for Speech to Text Technology
- Visually adaptable

Previous Adopted Materials:
Our previously adopted instructional materials (Introductory Chemistry by Zumdahl) can be maintained to be utilized for supplementing the Honors Chemistry Course. When we evaluate the current Living by Chemistry sequence, it may be decided to embellish the curriculum with additional laboratories or content topics by utilizing the existing physical materials and instructional materials. This is due to the difference in standards addressed in General Chemistry and Honors Chemistry (see expected Challenges below for details).

EXPECTED CHALLENGES

Rigor: Our general chemistry course is designed to meet the needs of all students and address specific NGSS physical science (chemistry) standards. Our Honors Chemistry course is a college preparatory course that covers NGSS standards plus additional material. Many students who take Honors Chemistry also take AP/IB courses, such as AP or IB Chemistry. The Honors Course also prepares students for the rigorous and mathematical skills needed to be successful at these advanced level courses. Materials Review Committee Member and a few chemistry teachers stated that some areas of Chemistry lacked rigor and some specific content that is traditionally taught in the Honors Chemistry classroom. However, there is a difference in scope between colleges and university expectations in student post-secondary preparation and what is outlined in the NGSS DCIs. Specifically, gas laws, acid/base reactions, nomenclature, and solutions. These topics are usually considered pre-requisite knowledge for STEM field science courses at the college level, but are not part of our Washington State Science Learning Standards or NGSS. The difference in expected standards will allow us to make a clear distinction between chemistry and honors chemistry and develop more detailed course frameworks that define how and what is taught and the

purpose/rationale for a college preparatory or honors chemistry. In order to address this concern, we will collaborate in cross district PLCs and job alike work groups to add in specific questions for students and to determine at which stages of instruction rigor will need to be elevated. Teachers have developed excellent supplement resources to address these aforementioned topics, which can be shared and outlined in the course frameworks process.

Parent and Community Feedback: Historically, feedback from high school science curriculum reviews has been extremely challenging to encourage for a multitude of reasons. The content and topics are often alienating for those who do not have backgrounds in science. Although we have attempted to challenge this perceptions and make our curriculum preview nights as welcoming and invitational as possible, with the focus not on the content, but rather the pedagogy, relevancy and student accessibility, it has been a barrier we have struggled to overcome. We plan on reviewing challenges with the Department of Equity and Outreach and seek their advice on improving trust and communication through lines with our communities.
In addition, attempting to collect feedback from parents and community members in the midst of a global pandemic was extremely challenging. Usually, many events are structured for question and answer sessions, viewing physical materials, and collecting feedback. For this adoption, events were planned in March, April, and May of 2020 on designated Middle and High School Nights. Each middle and high school site was to be prepared with in person translators and childcare and open stations, a model that worked well for both the K-5 and 678 Science Adoption processes. The digital website was prepared as a supplement to these events in addition to the feedback form. With the closure of school, momentum and communication about the process was lost to much more urgent and pressing needs. The curriculum review website was launched again in March 2021, just prior to teachers and students pivoting into the classroom for hybrid simultaneous instruction. Despite the length of time the site and feedback form was publicized and available for review, minimal feedback was obtained. During the May12th MRC and chemistry teacher meeting, it was determined that one final and exhaustive push for feedback was necessary to allow for community and parent perspective on the curriculum. The following methods were used to one final attempt for feedback:

- Peachjar flyer in English and Spanish to flyerboard
- Email announcement in English and Spanish to almost 13,000 Edmonds accounts with attached links and flyers
- Facebook, Twitter, and Instagram posts
- eNews article on the day the feedback forms closed

Although 12,955 accounts were pinged with flyers, announcements and posted to the external site only 9 individuals submitted a feedback form. The overall rate of return was 0.007%. Details of performance metrics are shown in figures:

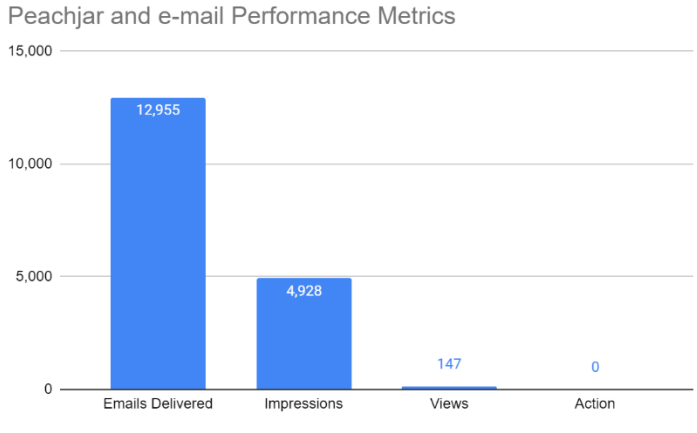


Figure 25: Total Emails Delivered compared to Views and Click Actions

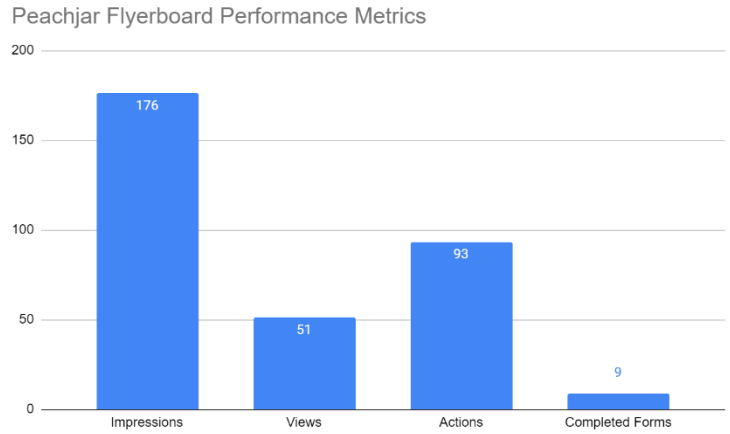


Figure 26: Total Peachjar Impressions, Views, Actions compared to completed feedback

SCIENCE MATERIALS: PROBEWARE SENSORS, SOFTWARE, AND INTERFACES

As previously mentioned, our high school sites need access to engaging and field tested physical materials to engage students in the Engineering and Technology Standards for NGSS and to prepare students for post-secondary success in STEM fields or college courses. Scientific instruments, such as probe ware sensors, and data collection software should be part of the core student experience.

NEEDS ASSESSMENT

On October 2019, all district science teachers attended the job-alike at Meadowdale Middle School. Teachers received updates on the materials being reviewed as part of the curriculum adoption process, were able to review materials and provide feedback or evaluate using the established rubric, and inventoried current laboratory materials. This was the first time that science teachers were able to discuss and visualize the inequitable distribution of materials across sites, after documenting their current materials. One of the most eye-opening data points for staff to consider was that Scriber Lake High School did not have any advanced scientific tools available for use in the classroom, and that materials (save for consumables) have not been replenished for an excess of 25 years. For ease of viewing, please review the current inventories lists on this google sheet, each school site has an indicated tab: District Compiled Science Inventory

Staff then studied their current course frameworks and identified key laboratories and activities that would be much improved by adding data collection sensors and graph visualizations. At minimum, 5 multi-day laboratories were identified as well as a multitude of shorter labs and station activities. After identifying these key student inquiry experiences, an initial draft of science materials was developed.

REVIEW AND PILOTING

REVIEW

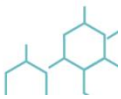
Department chairs and staff were tasked with refining the science materials list from January 2020-March 2021. After deep cleaning and review of science preparatory and storage spaces following our long closure for COVID, Department Chairs submitted final lists that included basic items in need of replacement. For example, for Scriber Lake and Mountlake Terrace High School determined that many student hot plates would need to be upgraded, while our other sites have been able to replace these items periodically over time with other funds. After discussing this with department chairs, it was determined that there would be a) an equal distribution of new tools at each site and b) equitable supplementation at sites with fewer materials to create symmetry in available materials in teacher's repertoires.

The science materials reviewed and proposed in this recommendation include the following:

- Sensors and Probes (Probeware)
    - Hardwired with USB
    - Bluetooth for mobile use (field studies outdoors)
    - A variety of materials for each content area
- Data Analysis and Visualization Software

Sensors

Software



    - Allows students to collect numerical data at discreet intervals
    - Supports students in manipulating and interpreting data sets and graphs
    - Accessible to all students
    - Allows students to conduct experiments in a remote setting with in person peers or vice versa
- Interfaces
    - The interface is the “computer” for the sensors and probes, that allow the probes and graphical analysis software to communicate and create visual data
    - The preferred interface is the smaller, more mobile product that allows students to take measurements outdoors
- Supplemental Laboratory Supplies
    - Examples include: hot plates, microscope upgrades such as cameras, spectrophotometers

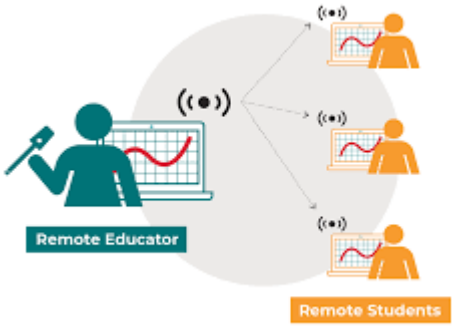


Figure 27: Graphics of Science Material Sensors for simultaneous learning

PILOTING

The pilot was conducted on a minimal basis, as these materials are currently used in our district. One aspect that was addressed was Chromebook and Chrome OS compatibility in terms of the data collections software as the original software used to analyze data, Logger Pro, was not compatible with the Chrome OS. However, a new software was developed during 2020-2021 called Graphical Analysis Pro which is compatible with the Chrome OS. This software was piloted internally by Student Learning with support of LIT and Technology and it was determined that this option would best suit students as it is a subscription based product and can be renewed or discontinued as needed. No additional piloting or technology review was suggested as this product fits the needs of students, teachers, and the recommended materials.

FINAL RECOMMENDATION AND ALLOCATIONS

It is recommended that all sites have access to the following science materials and the annual digital site license for the Edmonds School District. Complete allocation by site can be viewed on this google spreadsheet: Recommendation for Science Materials Allocation by Site 2021.

Category	Item Type	Quantity per Site
Sensor/ Probe	Motion Encoder Carts and Tracks	**8**
Sensor/ Probe	Pressure Sensor	**18**
Sensor/ Probe	Photogate	**18**
Sensor/ Probe	Motion Sensors	**9**
Sensor/ Probe	Force	**18**
Sensor/ Probe	Light	**18**
Sensor/ Probe	Turbidity Sensor	**3**
Sensor/ Probe	Temperature Sensors (USB- pack of 8)	**2**

Sensor/ Probe	Temperature Sensors (Wireless- pack of 8)	**2**
Sensor/ Probe	Spectrophotometer	**4**
Sensor/ Probe	Ph (teacher pack of 8)	**2**
Sensor/ Probe	Oxygen gas	**18**
Sensor/ Probe	Carbon Dioxide gas	**18**
Sensor/ Probe	Dissolved Oxygen	**10**
Interface	LabQuest Mini	**24**
Data Analysis and Visualization Software	Graphical Analysis Pro Site License	**1**

Table 5: Science Materials by category

SCIENCE MATERIALS IMPLEMENTATION PLAN

Science Materials Implementation Plan			
Timeline	**Summer 2021**	**2021-2022 School Year**	**2022-2023 School Year and Beyond**
Materials Implementation		**All materials available to be used**	**All materials available to be used**
Professional Development Options (Required)	Option A) August Summer Institute 1.5 hour Training • Materials set up • Laboratory Integration • Data Analysis • Student Accommodations	Option B) September Release or After School 1.5 hour Training • Materials set up • Laboratory Integration • Data Analysis • Student Accommodations	Options A and B) Summer/September Release/ After School 1.5 hour Training • Materials set up • Laboratory Integration • Data Analysis • Student Accommodations
Professional Development Options (Optional)		Monthly After School Support Sessions	Monthly After School Support Sessions
Materials Processes and Distribution	Materials barcoding and distribution to sites Software Purchased and uploaded		
Budget Estimates	Professional Development for 36 High School Teachers = $1425 District License for Graphical Analysis Pro = $199 annually		New Teacher Professional Development with 10% turnover estimate: $150-750 annually
Total 3 year Professional Development Allocation Estimate= $2,175			

APPENDICES I-IX

WHY DID WE NEED NEW SCIENCE STANDARDS?

Science, engineering, and technology Permeate every aspect of modern life. Some knowledge of science and engineering is required to understand and participate in many major public policy issues of today, as well as to make information every day decisions, such as selecting among alternative medical treatments or determining whether to buy an energy efficient furnace. By the end of the 12th grade, students should have sufficient knowledge of science and engineering to engage in public discussions on science-related issues, to be critical consumers of scientific information related to their everyday lives, and to be able to continue to learn about the science throughout their lives.

Today, science education in the United States is not guided by a common vision of what students finishing high school should know and be able to do in science. Too often, standards are long list of detailed and disconnected facts, reinforcing the criticism that our schools science curriculum tend to be "a mile wide and an inch deep. " Not only does this approach alienate young people, it also leaves them with fragments of knowledge and little sense of the inherent logic and consistency of science and of its universality. Moreover, the current fragmented approach neglects the need for students to engage in doing science and engineering, which is a key part of understanding science.-National Academy of Sciences, Report Brief, 2011

WHERE DID THE NEXT GENERATION SCIENCE STANDARDS COME FROM?

The Next Generation Science Standards (NGSS) were built from *A Framework for K-12 Science Education*.

> The National Research Council (NRC) of the National Academy of Sciences was asked to develop a framework that would provide unifying guidance for the nation's schools to improve all students' understanding of science. The expert committee that developed the framework used research-based evidence on how students learn, input from a wide array of scientific experts and educators, and post national reform efforts, as well as its members' individual expertise and collective judgement. -National Academy of Sciences, Report Brief, 2011

A consortium of states used the framework developed by the experts to create the standards known as Next Generation Science Standards. Washington State participated in both the writing and review of the Next Generation Science Standards (NGSS) and adopted the NGSS now known as the *Washington State 2013 K-12 Science Learning Standards*.

After a five year implementation plan (2013-2017) that guided districts in aligning their curriculum and practice to the *Washington State 2013 K-12 Science Learning Standards*, Washington State released a science assessment in the 2017-2018 school year known as the *Washington Comprehensive Assessment of Science* (WCAS). The WCAS assessment is currently taken in Edmonds School District in the 5th, 8th, and 11th grade levels.

WHAT ARE THE INSTRUCTIONAL SHIFTS?

Science educators in the United States are adapting to a new vision of how students learn science. Children are natural explorers, and their observations and intuitions about the world around them are the foundation for science learning. Unfortunately, the way science has been taught in the United States has not always taken advantage of those attributes. Some students who successfully complete their K-12 science classes have not really had the chance to "do" science for themselves in ways that harness their natural curiosity and understanding of the world around them. - National Academy of Sciences, 2017

A New Vision for Science Education

Implications of the Vision of the Framework for K-12
Science Education and Next Generation Science Standards

Science Education Will Involve Less:	Science Education Will Involve More:
Rote memorization of facts and terminology	Facts and terminology as needed while developing explanations and designing solutions supported by evidence-based arguments and reasoning
Learning of ideas disconnected from questions about phenomena	Systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned
Teachers providing information to the whole class	Students conducting investigations, solving problems, and engaging in discussions with teachers' guidance
Teachers posing questions with only one right answer	Students discussing open-ended questions that focus on the strength of the evidence used to generate claims
Students reading textbooks and answering questions at the end of the chapter	Students reading multiple sources; including science-related magazine and journal articles and web-based resources; students developing summaries of information.
Pre-planned outcome for "cookbook" laboratories or hands-on activities	Multiple investigations driven by students' questions with a range of possible outcomes that collectively lead to a deep understanding of established core scientific ideas
Worksheets	Student writing of journals, reports, posters, and media presentations that explain and argue
Oversimplification of activities for students who are perceived to be less able to do science and engineering	Provision of supports so that all students can engage in sophisticated science and engineering practices

Source: National Research Council. (2015). Guide to Implementing the Next Generation Science Standards (pp.8-9).Washington, DC: National Academies Press. http://www.nap.edu/catalog/18802/guide-to-implementing-the-next-generation-science-standard

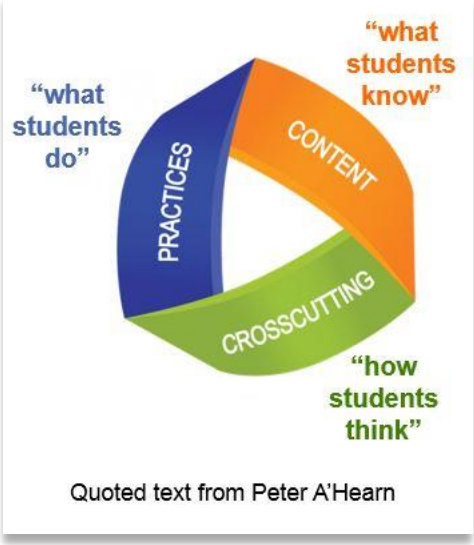
THE NGSS OFFER FIVE INNOVATIONS FOR TEACHING

1. **Three Dimensional Learning:** There are three equally important, distinct dimensions to learning science included in the NGSS: Scientific and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas. The NGSS connect all three dimensions. To prepare students for success in college and 21st century careers, the NGSS also connect scientific principles to real-world situations, allowing for more engaging and relevant instruction to explore complicated topics.
2. **All three dimensions build coherent learning progressions:** The NGSS provide students with continued opportunities to engage in and develop a deeper understanding of each of the three dimensions of science. Building on the knowledge and skills gained from each grade—from elementary through high school—students have multiple opportunities to revisit and expand their understanding of all three dimensions by the end of high school.
3. **Students engage with phenomena and design solutions:** In instructional systems aligned to the NGSS, the goal of instruction is for students to be able to explain real-world phenomena and to design solutions using their understanding of the Disciplinary Core Ideas. Students can achieve this goal by engaging in the Science and Engineering Practices and applying the Crosscutting Concepts.
4. **Engineering and the Nature of Science is integrated into science:** Some unique aspects of engineering (e.g., identifying problems) are incorporated throughout the NGSS. In addition, unique aspects of the nature of science (e.g., how theories are developed) are also included throughout the NGSS as practices and crosscutting concepts.
5. **Science is connected to math and literacy:** The NGSS not only provide for coherence in science instruction and learning but the standards also connect science with mathematics and English Language Arts. This meaningful and substantive overlapping of skills and knowledge affords all students equitable access to the learning standards.

Achieve, Inc. 2016. NGSS Factsheet.

NGSS THREE-DIMENSIONAL LEARNING

The NGSS shift the focus away from students learning about science to students doing science. K-12 students parallels the way scientific knowledge is developed in the real world by intertwining the three dimensions of the NGSS: The Science and Engineering practices (what scientists and engineers do), Disciplinary Core ideas (big ideas that make up foundational knowledge used by scientists and engineers), and Crosscutting Concepts (common themes that apply across science domains).



HOW DO I READ THE STANDARDS?

See appendix __ for the complete 6-8 performance expectations.

The *NGSS* architecture was designed to provide information to teachers and curriculum and assessment developers beyond the traditional one-line standard. The Performance Expectations are the policy equivalent of what most states have used as their standards.

> In order to show alignment and coherence to the *Framework*, the *NGSS* include the appropriate learning goals in "foundation boxes" in the order in which they appeared in the *Framework*. They were included to ensure curriculum and assessment developers should not be required to guess the intent of the Performance Expectations. -NSTA.com, 2014

To review the specific science standards visit:

HTTP://WWW.NEXTGENSCIENCE.ORG/EVIDENCE-STATEMENTS

APPENDIX II: SCIENCE EVALUATION RUBRIC

Edmonds School District

Science Curriculum Evaluation Rubric

HS NGSS Science Adoption 2019

Current as of April 19, 2019

Drafted by Jennifer Hageman, 7-12 Science Lead, Secondary Student Learning

This rubric was designed through committee work of the Edmonds School District Science Materials Review Committee. The purpose of this rubric is to assist educators in evaluating core curriculum, including lessons, activities or investigations, units, and sequences of multiple units to determine its alignment with the conceptual shifts of the NGSS. Because the criteria is aligned to the Next Generation Science Standards and the NRC Framework for K-12 Science Education, a comprehensive understanding of these documents should be in place. The NRC Framework clearly emphasizes the shifts in science education that should be present in instructional materials:

1) Three-dimensional learning – students engage in science and engineering practices to learn content, while relating and understanding that content through the lens of crosscutting concepts.

2) Explaining phenomena and designing solutions– students investigate the world around them in order to explain phenomena and use their scientific understanding to design solutions to problems.

3) Engineering design and the nature of science– students do authentic work of scientists and engineers, explicitly seeing themselves in those roles and understanding what that entails.

4) Coherent learning progressions– within a grade and from K-12, three-dimensional learning builds on past experience, avoiding redundancy and building connections across disciplines.

5) Connections to English/language arts and mathematics– students' learning reflects real-world contexts as it explicitly uses practices and understandings from mathematics and English/language arts.

For scoring, committee members will use a 4 point scale evaluating each criteria. A score of 4 indicates a high degree of NGSS alignment and a score of 1 indicates traditional, non-NGSS aligned materials. A coefficient score is applied to categories that are weighted due to importance.

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

This rubric was not intended to replace an in-depth review of a unit through the use of the EquIP or PEEC rubrics, but is designed to allow educators a faster preliminary review of a potential lesson, activity, or resource to determine its appropriateness and alignment to NGSS. This evaluation tool draws heavily from the EQuIP rubric and PEEC alignment tools, developed by Achieve. NGSS Early Adopter State Rubrics from Wisconsin, Oregon, Georgia, and Iowa were also utilized in this process. Cross referenced citations are located here.

Category A: NGSS 3-Dimensional Design				
Criteria	**4**	**3**	**2**	**1**
A1 : Phenomena Based Making sense of a phenomena and or designing solutions to a problem drive student learning.	Learning is organized around essential questions and investigating meaningful phenomena through student initiated explorations and with opportunities to design their own procedures and build evidence.	Phenomena is present with the goal of making sense of the world (not just covering content), but appears loosely connected and student explorations are investigations provided to them.	Learning has limited explicit connection to students' day-to-day lives and questions and while learning may be difficult, but is not conceptually rigorous - - student work confirms equations and/or generally follows a set procedure	Organized by big content ideas, each section/chapter having lab idea(s) that largely confirm learning about that content with no meaningful phenomena present.
A2: Disciplinary Core Ideas (DCIs) DCIs are the fundamental ideas that are necessary for understanding a given science discipline. The core ideas all have broad importance within or across science or engineering disciplines, provide a key tool for understanding or investigating complex ideas and solving problems, relate to societal or personal concerns, and can be taught over multiple grade levels at progressive levels of depth and complexity.	Content is examined and experienced in a meaningful and authentic manner and builds coherently towards answering the essential question while remaining age-appropriate* and connecting more than one science discipline. *NSTA DCI Matrix	Content is connected to meaningful phenomena but the connection is loose or requires teacher prompting for student to see connection.	Students interact with content in somewhat meaningful ways but with little need to apply the content to real-world situations or phenomena	Content is presented through worksheets or activities that focus on simple memorization of facts.
A3: Cross Cutting Concepts (CCCs) These are concepts that hold true across the natural and engineered world. Students can use them to make connections across seemingly disparate disciplines or situations, connect new learning to prior experiences, and more deeply engage with material across the other dimensions. The NGSS requires that students explicitly use their understanding of the CCCs to make sense of phenomena or solve problems.	Learning is framed by big ideas of science/ themes (cross-cutting concepts) in a grade-appropriate manner* that would allow students to see and/or describe the connections to phenomena within or across disciplines. *NSTA CCC Matrix	Learning is framed by big ideas of science/ themes (cross-cutting concepts) but likely would not be explicitly seen by students without teacher prompting or guidance.	Learning may be framed by big ideas of science/ themes (cross-cutting concepts) but connections are implicit or very loosely connected	Learning is not framed by big ideas of science/ themes. (cross-cutting concepts) and concepts are disconnected from unit to unit.
A4: Science and Engineering Practices (SEPs) Students do the authentic work of scientists and engineers, explicitly seeing themselves in those roles and what that entails. Engineering is embedded in the learning sequence to support solutions.	Students engage in grade-appropriate scientific and engineering practices* to learn about the world around them and solve problems with little prompting and teacher guidance. *NSTA SEP Matrix	Students engage in science and engineering practices but their engagement is teacher-directed.	Students are asked to follow a scientific method instead of identifying science and engineering practices.	Students are not utilizing any science or engineering practices.
A5: 3 Dimensions are Integrated Builds understanding of multiple age appropriate elements of the SEPs, DCIs, and CCCs that are deliberately selected to aid in student sense making of the phenomena and/or designing of solutions. Student sense making of the phenomena and or designing of solutions requires students to use the SEPs and CCCs in authentic ways.	A blend in practices, content, and crosscutting concepts is evident in how material is presented, not just what	Lesson utilizes the three dimensions, but they are incorporated as 3 separate entities	Lesson or activity utilizes two of the three dimensions (content, or science/engineering practices, or cross-cutting concept)	Lesson or activity appears to only utilize one of the three dimensions with student learning centered on

	students are asked to do. The three dimensions are woven together to work cohesively and not as three separate ideas			facts; content is an end in itself.
A6: Unit Coherence and Connections Lessons fit together to target a specific set of performance expectations (PEs). When appropriate, links are made across the science domains. Grade level connections are made between CCSS in Math and ELA, Social Studies and Technical Subjects.	Students have a clear path and multiple opportunities to develop proficiency of performance expectations. Activities or assessments utilize cross disciplinary skills (developing claims, perform operations with numbers).	Content targets a specific set of PEs, but students may only have one experience to show demonstrate proficiency. Most activities or assessments utilize cross disciplinary skills	Some but not all PEs are addressed, or the connections between activity and the PE are superficial. Attempts are made to connect subject area, but purpose may be unclear to students.	Lessons or activity appears only to utilize aspects of performance expectation; science is isolated and not connected to other subject areas.
Subtotal				

Total*	/24
Coefficient x2*	

Provide any additional feedback about the overall Category in this space.

**DO NOT proceed to Categories B-G* if Total is below 12, or each criteria is 2 or below. It is a requirement of the Edmonds School District that materials be designed or strongly aligned to NGSS. If materials score a 2 or below in one criteria, specific evidence must be cited and will be collectively evaluated by the committee.*

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Category B: Student Engagement						**Notes**
Criteria		**4**	**3**	**2**	**1**	
B1	The context of learning experiences, including relevant phenomenon, questions or problems engages students in 3-d learning through inquiry and engineering design.					
B2	Provides relevant hands on experiences as "activities" and "labs" that allow students to explore and make sense of the physical and natural world					
B3	Provides opportunities to connect their explanation of a phenomenon and/or design solution to their own experience at home, life, school or careers, taking into account student choice, agency, and voice					
B4	Opportunities to practice scientific discourse in oral, visual and/or written form and to respond to peers and teacher feedback as scientifically literate citizens.					
	Subtotal					
	Category B Total	/16				

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Category C: Monitoring Student Progress						**Notes**
Criteria		**4**	**3**	**2**	**1**	
C1	Elicits direct, observable evidence of 3-D learning using practices with core ideas and CCCs to make sense of phenomena and or to design solutions that have been covered adequately in the instructional materials. Teachers should be able to collect artifacts showing a student's growth in these areas.					
C2	Platform is easy to navigate, with downloadable, editable, and device independent materials					
C3	Elicits direct observable evidence of 3-D learning using practices with DCI and CCCS to make sense of phenomena through ongoing formative assessments.					
C4	Provides quality test banks that include questions with a full spectrum of rigor from recall to application. Rubrics that assess students in 3 dimensions, complete with opportunities for demonstration of learning in multiple domains.					
	Subtotal					
	Category C Total	/16				

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Category D: Instructional Supports						**Notes**
Criteria		**4**	**3**	**2**	**1**	
D1	Provides strategies for linking student learning across lessons and between units.					
D2	Instructional sequence consistently provides multiple opportunities and adequate time for student learning (by lesson and unit).					
D3	Uses diverse instructional strategies in a logical progression of instruction that provide clear purposes for learning experiences (e.g., elicit preconceptions, teach new knowledge, build skills and abilities, connect to prior knowledge)					
D4	Engineering is embedded. Clear instructions and pedagogy are outlined for students and teachers.					
D5	Background information, Instructions for academic discourse and roles are included to support facilitation in the classroom, corresponding research, model videos are included to support the needs of teachers with a variety of experience teaching science.					
	Subtotal					
	Category D Total	/ 20				

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Category E: Technology						**Notes**
Criteria		**4**	**3**	**2**	**1**	
E1	Provide virtual lab simulations that support, extend, and enhance learning experiences but do not replace hands-on activities that also include a component of student choice.					
E2	Supplies and equipment are high quality (durable, dependable) and organized, with thorough lists of consumable and non-consumable materials aligned for both instruction and assessment					
E3	Content contains grade-appropriate scientific information, vocabulary, phenomena, models and representations to support student's three-dimensional learning, in an easy to navigate platform that allows students to easily transition between hands on activities and device dependent learning.					
	Subtotal					
	Category E Total	/12				

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Category F: Differentiated Instruction						**Notes**
Criteria		**4**	**3**	**2**	**1**	
F1	Provides guidance for teachers to support differentiated and culturally responsive (i.e., purposefully represents diverse cultures, linguistic backgrounds, learning styles, and interests) instruction in the classroom so that every student's needs are addressed					
F2	Appropriate scaffolding, Interventions, and supports, including integrated and appropriate reading, writing, listening, and speaking alternatives (e.g., translations, picture support, graphic organizers) that neither sacrifice science content nor avoid language development for English language learners, special needs, or below grade level readers. Digital and print resources that provide various levels of readability (e.g., based on the CCSS three part model for measuring text complexity). Materials are in multiple language formats.					
F3	Modifications and extensions for all students, including those performing above their grade level, to develop deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts. Gradual release					
F4	Includes grade-level appropriate academic and content-specific vocabulary in the context of the learning experience that is accessible, introduced, reinforced, reviewed and augmented with visual representations when appropriate.					
F5	Includes grade-level appropriate informational text (e.g., digital and print resources) that supports conceptual understanding of the disciplinary core ideas.					
	Subtotal					
	Category F Total	/ 20				

(4)	NGSS designed. May require very little modification. The element is presented in full and is of good quality. It would be supportive of student learning.
(3)	Mostly NGSS aligned. May require some modification or accommodations for students. The element is present. May need a little supplementation, but could be used adequately to support student learning.
(2)	Mostly Traditional. Would require a moderate amount of modification for NGSS alignment. The element is not present, partially present, or of very poor quality. Major supplementation is needed to adequately support student learning.
(1)	Traditional. Would require major modifications for NGSS alignment. The element is not present at all.

Category G: Bias						**Notes**
Criteria		**4**	**3**	**2**	**1**	
G1	The program reflects the depth and breadth of diversity found in the real world.					
G2	Males and females are equally represented in text and graphics.					
G3	Materials contain racial/ethnic balance in text and graphics.					
G4	Persons with and without disabilities are represented in text and graphics.					
G5	Characters are described by their behaviors, beliefs, and values, rather than unnecessary socio-economic descriptors.					
G6	In addition to the traditional nuclear family model, family groups are depicted in which there are single parents, adopted and foster children, step-parents, same-sex parents, and/or relatives living with the family.					
G7	Program avoids use of stereotypical language and images.					
	Subtotal					
	Category F Total	/ 28				

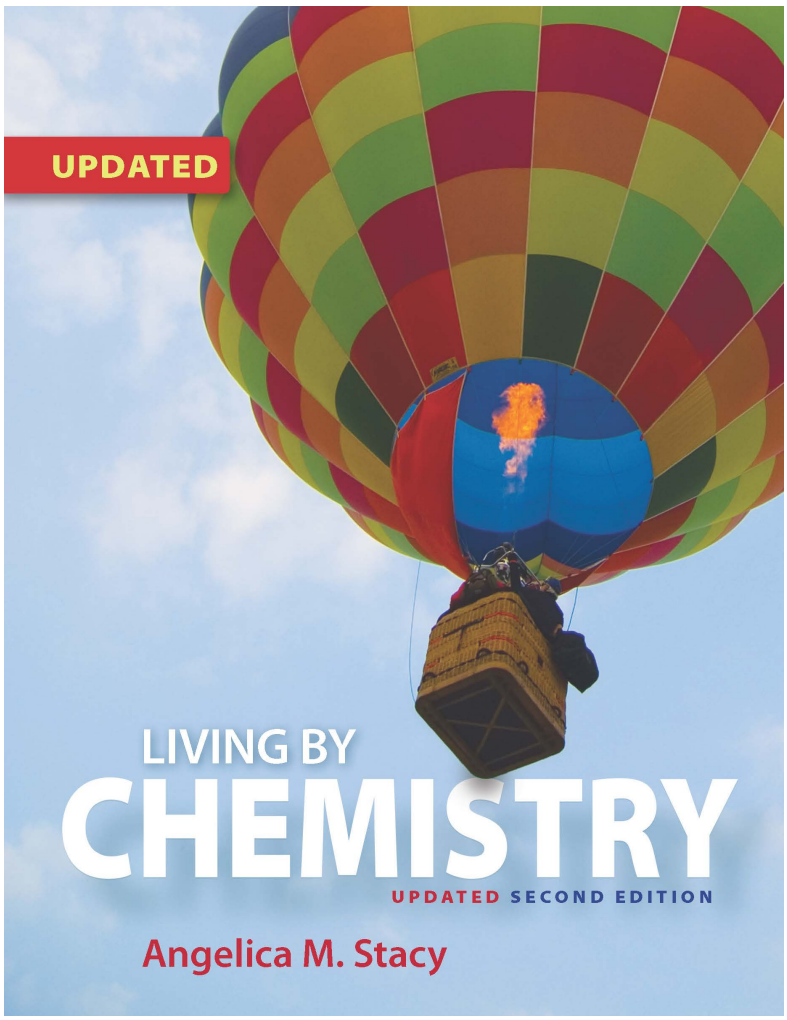
[+] Pursuant to ESD Board Policy 2020: "Instructional materials shall be free of bias pertaining to sex, race, creed, religion, color, national origin, honorably discharged veteran or military status, sexual orientation including gender expression or identity, the presence of any sensory, mental, or physical disability, or the use of a trained dog guide or service animal."

[*] See separate "Washington Models for the Evaluation of Bias" document for best practices in conducting this section of the review.

APPENDIX III: NGSS ALIGNMENT MATRICES PROVIDED BY BFW

bedford, freeman, & worth
High School Publishers

Living By Chemistry: Correlations Compatible with Next Generation Science Standards



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1		U1 C1: Defining matter	U1 C2: Basic Building Materials	U1 C3: A World of Particles	U1 C4: Moving Electrons	U1 C5: Building with Matter	U2 C6: Speaking of Molecules	U2 C7: Building Molecules	U2 C8: Molecules in Action	U2 C9: Molecules in the Body	U3 C10: Physically Changing Matte	U3 C11: Pressing Matter	U3 C12: Concentrating Matter	U4 C13: Toxic Changes	U4 C14: Measuring Toxins	U4 C15: Toxins in Solution	U4 C16: Acidic Toxins	U4 C17: Toxinc Cleanup	U5 C18: Observing Energy	U5 C19: Measuring Energy	U5 C20: Understanding Energy	U5 C21: Controlling Energy	U5 C22: Radiating Energy	U6 C23: Chemical Equilibrium	U6 C24: Changing Conditions
2	HS-PS1-1		✓		✓	✓	✓		✓					✓				✓			✓	✓			
3	HS-PS1-2		✓		✓	✓	✓							✓			✓	✓		✓		✓		✓	
4	HS-PS1-3					✓		✓	✓				✓	✓			✓	✓				✓		✓	✓
5	HS-PS1-4						✓													✓	✓	✓			
6	HS-PS1-5																				✓				
7	HS-PS1-6																								✓
8	HS-PS1-7		✓				✓							✓			✓	✓							
9	HS-PS1-8			✓																					
10	HS-PS2-1																								
11	HS-PS2-2											✓													
12	HS-PS2-3																								
13	HS-PS2-4				✓													✓				✓			
14	HS-PS2-5																								
15	HS-PS2-6					✓	✓	✓	✓											✓		✓			
16	HS-PS3-1																		✓	✓	✓	✓	✓		
17	HS-PS3-2										✓	✓	✓												
18	HS-PS3-3																				✓	✓			
19	HS-PS3-4																		✓	✓					
20	HS-PS3-5								✓																
21	HS-PS4-1																					✓			
22	HS-PS4-2																								
23	HS-PS4-3																								
24	HS-PS4-4																					✓			
25	HS-PS4-5																								

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1		U1 C1: Defining matter	U1 C2: Basic Building Materials	U1 C3: A World of Particles	U1 C4: Moving Electrons	U1 C5: Building with Matter	U2 C6: Speaking of Molecules	U2 C7: Building Molecules	U2 C8: Molecules in Action	U2 C9: Molecules in the Body	U3 C10: Physically Changing Matter	U3 C11: Pressing Matter	U3 C12: Concentrating Matter	U4 C13: Toxic Changes	U4 C14: Measuring Toxins	U4 C15: Toxins in Solution	U4 C16: Acidic Toxins	U4 C17: Toxinc Cleanup	U5 C18: Observing Energy	U5 C19: Measuring Energy	U5 C20: Understanding Energy	U5 C21: Controlling Energy	U5 C22: Radiating Energy	U6 C23: Chemical Equilibrium	U6 C24: Changing Conditions
2	SEP-1								✓													✓			
3	SEP-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	SEP-3										✓	✓	✓			✓				✓					
5	SEP-4	✓		✓		✓	✓	✓	✓		✓	✓					✓	✓	✓	✓					
6	SEP-5	✓									✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	SEP-6	✓	✓				✓	✓	✓		✓	✓	✓				✓			✓					
8	SEP-7	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓				✓	✓		✓		
9	SEP-8			✓							✓	✓		✓	✓			✓			✓			✓	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1		U1 C1: Defining matter	U1 C2: Basic Building Materials	U1 C3: A World of Particles	U1 C4: Moving Electrons	U1 C5: Building with Matter	U2 C6: Speaking of Molecules	U2 C7: Building Molecules	U2 C8: Molecules in Action	U2 C9: Molecules in the Body	U3 C10: Physically Changing Matter	U3 C11: Pressing Matter	U3 C12: Concentrating Matter	U4 C13: Toxic Changes	U4 C14: Measuring Toxins	U4 C15: Toxins in Solution	U4 C16: Acidic Toxins	U4 C17: Toxinc Cleanup	U5 C18: Observing Energy	U5 C19: Measuring Energy	U5 C20: Understanding Energy	U5 C21: Controlling Energy	U5 C22: Radiating Energy	U6 C23: Chemical Equilibrium	U6 C24: Changing Conditions
2	1- Patterns	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	2-Cause and Effect	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓				✓	✓		✓		
4	3-Scale, Proportion and C	✓		✓		✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	4-Systems and Models	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	5-Energy and Matter	✓	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7	6-Structure and Function		✓	✓	✓	✓	✓	✓	✓			✓					✓				✓	✓			✓
8	7-Stability and Change			✓	✓						✓	✓	✓								✓	✓		✓	✓

APPENDIX IV: TECHNOLOGY SURVEY AND REVIEW

The digital companion materials and integration has been approved and is compatible with current district technologies, including Skyward and Canvas. To view the full compatibility and screening survey for this vendor, go to the following google sheet:
https://docs.google.com/spreadsheets/d/12HBPvoRgVYV39BwqTCd2p8omjFfHb-l-lfSbI22wFjs/edit?usp=sharing

APPENDIX V: PARENT AND COMMUNITY FEEDBACK AND REVIEW RESOURCE LINKS

To view the Chemistry Curriculum Review website, go to the following linked site:
https://sites.google.com/edmonds.wednet.edu/esd15highschoolscienceadoption/home

Edmonds Peachjar Flyerboard

Spanish Peachjar Flyer

English Peachjar Flyer

APPENDIX VI: PURCHASE OVERVIEW FOR CHEMISTRY

Living By Chemistry Adoption Purchase Estimate	
Item	**Total Category Expense**
Student Textbooks with 8 year digital license	$132,320
Teacher Materials	In gratis
Total 3 year Professional Development Allocation Estimate	$21,400
Total Cost Estimate for General Chemistry	**$153,720**
Total Cost Estimate for Honors and General Chemistry	**$231,290**

Science Materials Purchase Overview					
	Item	**Model:**	**Price/individual item**	**Number per school**	**Total Category pricing**
Sensor/ Probe	Motion Encoder Carts and Tracks	DTS-EC	$445.00	**8**	$3,560.00
Sensor/ Probe	Pressure Sensor	GPS-BTA	$89.00	**18**	$1,602.00
Sensor/ Probe	Photogate	VPG-BTD	$49.00	**18**	$882.00
Sensor/ Probe	Motion Sensors	MD-BTD	$89.00	**9**	$801.00
Sensor/ Probe	Force	DFS-BTA	$109.00	**18**	$1,962.00
Sensor/ Probe	Light	LS-BTA	$59.00	**18**	$1,062.00
Sensor/ Probe	Turbidity Sensor	TRB-BTA	$112.00	**3**	$336.00
Sensor/ Probe	Temperature Sensors (wired - pack of 8)	GT-TP	$299.00	**2**	$598.00
Sensor/ Probe	Temperature Sensors (Wireless- pack of 8)	GO-TEMP	$599.00	**2**	$1,198.00
Sensor/ Probe	Spectrophotometer	GDX-VDISPL	$399.00	**4**	$1,596.00
Sensor/ Probe	Ph (teacher pack of 8)	GDX-PH-TP	$758.00	**2**	$1,516.00
Sensor/ Probe	Oxygen gas	GDX-O2	$189.00	**18**	$3,402.00
Sensor/ Probe	Carbon Dioxide gas	GDX-CO2	$199.00	**18**	$3,582.00
Sensor/ Probe	Dissolved Oxygen	GDX-ODO	$298.00	**10**	$2,980.00
Interface	LabQuest Mini	LQ-MINI	$169.00	**24**	$4,056.00
Total Probeware Cost Per Site					**$29,133.00**
District Graphical Analysis Pro Site License (for all K-12 schools) annual purchase					**$199.00**
Total Probeware and License Cost for District					**$145,864.00**
Estimated Professional Development for 3 years					**$2,175.00**
TOTAL					**$148,039.00**

APPENDIX VIII: ACKNOWLEDGEMENTS

Acknowledgements

A special thanks to the families, community members, and students of the Edmonds School District that participated in reviewing and providing feedback on curricula throughout the adoption process.

Material Review Committee

Pete Bonifaci, Lynnwood High School

Richard Croxon, Scriber Lake High School

Corrine Daycross, Meadowdale High School

Kelly Hayes, Edmonds Woodway High School

Allen Paves, Meadowdale High School

Corey Thomas, Meadowdale High School

Dianne Thompson, Meadowdale High School

Jonathan Tong, Mountlake Terrace High School

Brenda Torres, Lynnwood High School

John Traxler, Mountlake Terrace High School

Susan Russell, Lynnwood High School

Student Learning Science Adoption Team

Jennifer Hageman
7-12 Science Lead

Kim Hunter
Manager of Secondary Education

Rob Baumgartner
Executive Director of Student Learning

Diane Martineau
K-12 Instructional Material Support Specialist

Lenora Carey
Science Material Specialist

Valued Consultants

Professional Education Committee (PEC)

Instruction Material Committee (IMC)

Christa Polzin
Instructional Technology Coordinator

Jen Madson
Information Systems Supervisor

Chris Hagen
Information Systems Data Analyst

APPENDIX IX: RESEARCH AND REFERENCES

Achieve. “Next Generation Science Standards: Read the Standards.” *Next Generation Science Standards*, 2013, www.nextgenscience.org/search-standards.

Achieve. “PEEC Professional Learning Facilitator's Guide.” *Next Generation Science Standards*, 2018, nextgenscience.org/peecpl.

“EQuIP Professional Learning Facilitator's Guide.” Edited by Tricia Shelton, *Next Generation Science Standards*, 2017, www.nextgenscience.org/resources/equip-professional-learning-facilitator%E2%80%99s-guide-0.

National Academies of Sciences. “Seeing Students Learn Science: Integrating Assessment and Instruction in the Classroom.” *National Academies Press: OpenBook*, 27 Mar. 2017, www.nap.edu/catalog/23548/seeing-students-learn-science-integrating-assessment-and-instruction-in-the.

National Research Council, and Committee. “Guide to Implementing the Next Generation Science Standards.” *National Academies Press: OpenBook*, 8 Jan. 2015, www.nap.edu/catalog/18802/guide-to-implementing-the-next-generation-science-standards.

NSTA. “Introduction.” *NGSS@NSTA*, 2014, ngss.nsta.org/front-matter.aspx.

Rhodes, Holly. *Design, Selection, and Implementation of Instructional Materials for the next Generation Science Standards: Proceedings of a Workshop*. The National Academies Press, 2018.

The National Academy of Science. “Board Brief: A Framework For K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.” *The National Academies of Science, Engineering, and Medicine*, The National Academy Press , July 2011, www.nap.edu/resource/13165/dbasse_071099.pdf.

The Recommendation:

i-Ready Math:
Support the advancement and growth of a data-informed school district culture and require the use of i-Ready Math Diagnostic and Online Instruction in grades K through 8 and require the use of the i-Ready Math Diagnostic in grade 9.

i-Ready Reading: Continue to support the use of the i-Ready Reading Diagnostic and Online Instruction in grades K through 8 and maintain the current optional status in grades 3 through 8 in order to collect more data to inform a longer term recommendation moving forward. ~~It is recommended to require use of i-Ready Reading in grades K-2 in order for it to be an option as a screener to meet the state mandate for a Dyslexia screener.~~

Revised by Board Motion 6.22.21
Revised recommendation approved