| Board Office Use: **Legislative File Info.** | |
|---|---|
| File ID Number | 18-2017 |
| Introduction Date | 10/10/18 |
| Enactment Number | 18-1629 |
| Enactment Date | 10/24/18 os |

OAKLAND UNIFIED SCHOOL DISTRICT
*Community Schools, Thriving Students*

# Memo

**To** Board of Education

**From** Kyla Johnson-Trammell, Superintendent
Wesley Jacques, Executive Director, Academics and Instructional Innovation Department
Brenda Tuohy, Director, science, technology, engineering and mathematics

**Board Meeting Date** October 10, 2018

**Subject** Amendment No. 1 to the Purchase Agreement for Foss Elementary Materials, Supplies and Equipment between Oakland Unified School District and Delta Education
Contractor: Delta Education, LLC
Services For: Science Department, Academics and Instructional Innovation Department

**Action Requested and Recommendation**

Approval by the Board of Education of Amendment No. 1 to the Purchase Agreement between the District and Delta Education, LLC, Nashua, NH (Enactment No. 18-0826), to memorialize Delta's commitment of delivery of all FOSS kits/modules to the OUSD warehouse for distribution in two delivery dates of October 19, 2018 and November 2, 2018; and for the District to commit to the full payment of $1,673,050.15 to Delta (and to not exceed a grand total of $1,793,050, based on the$1,673,050.15 purchase plus an additional estimated $120,000 for refurbishment supplies) according to the following installment plan: first installment by November 1, 2018, second installment by August 15, 2019, and third installment by August 15, 2020, according to the Order of Products as attached to the Amendment No. 1 as Exhibit B. All other terms and conditions remain in full force and effect.

**Background**
*(Why do we need these services? Why have you selected this vendor?)*

On May 9, 2018, by Enactment No. 18-0826, the District's Board adopted Resolution No. 1718-0160, which (1) adopted the instructional science materials as identified therein and (2) approved a Purchase Agreement with Delta for the purchase of said instructional materials in an amount not to exceed a total of $1,793,050.15. Under the Agreement, if the District actually orders all of the materials as identified in the Purchase Agreement (*i.e.,* Exhibit C to the Resolution), the District is able to pay $1 Million in 2018/2019 and then whatever remains of the balance of the total contract not to exceed amount of $1,793,050.15 (*i.e.,* no more than $793,050.15) in 2019/2020. Because of the District's current fiscal situation, Delta has agreed to amend the installment payment schedule under the Purchase Agreement such that the following payments will be made:

- First installment of $760,000 by November 1, 2018.
- Second installment of $456,525.75 by August 15, 2019.
- Third installment of the balance that remains of the total $1,673,050.15 (which will be $456,524.40), along with the cost of any refurbishment supplies ordered in an amount not to exceed $120,000, by August 15, 2020.

The not to exceed total shall remain $1,793,050.15. As the District intends to order all of the materials (except the refurbishment supplies) during the 2018/2019 school year, it will be obligated to pay the amounts due under the Purchase Agreement pursuant to the agreed-upon schedule, including for the listed future years.

| | |
|---|---|
| **Competitively Bid** | Was this contract competitively bid? No<br>If no, exception: Educational Materials. |
| **Fiscal Impact** | Funding resource(s): Lottery Funds or Base General Purpose Funds, depending on 2018-19, 2019-20 and 2020-21 budgets. |
| **Attachments** | • Amendment No. 1, Purchase Agreement<br>• Resolution No. 1718-0160 – FOSS Next Generation Science Instructional Materials, Legislative ID #18-0276 |

# AMENDMENT NO. 1 TO THE PURCHASE AGREEMENT FOR FOSS ELEMENTARY MATERIALS, SUPPLIES AND EQUIPMENT BETWEEN OAKLAND UNIFIED SCHOOL DISTRICT AND DELTA EDUCATION

This Amendment No. 1 is entered into by and between Oakland Unified School District ("District"), and Delta Education, LLC, a Delaware limited liability company ("Delta" or "Contractor") (collectively, the "Parties").

## RECITALS

1. WHEREAS, the District and Delta entered into a purchase agreement effective May 9, 2018 (OUSD Enactment No. 18-0826) ("Agreement"), a true and correct copy of which is attached hereto as Exhibit A.
2. WHEREAS, the Parties intend to alter the character and schedule of payments by the District to Delta under Article 7 of the Agreement pursuant to Section 32 of the Agreement.
3. The foregoing recitals are agreed to by the Parties.

## TERMS AND CONDITIONS

In consideration for the terms set forth below, the Parties agree to amend the Agreement as follows:

1. Restatement of Article 5 of the Agreement – The following shall replace in its entirety Article 5 of the Agreement:

   This Agreement is a commitment on the part of the District to purchase Product from Contractor, as set forth in Exhibit B. Product will be purchased pursuant to the Order of the District in the form as attached hereto and incorporated herein and labeled Exhibit B. For the purpose of the Agreement the attached Exhibit B shall further define the term "Order."

   The Product and any Deliverables to be provided are specified in the Order, including all attachments thereto. The Order shall be deemed a separate agreement that incorporates the terms and conditions of this Agreement by reference.

   The Order issued hereunder shall, at a minimum, contain the following:
   a. The incorporation by reference of this Agreement;
   b. The locations where Product will be delivered are as follows;
      i. All FOSS kits/modules are to be delivered to the Oakland Unified School District warehouse; and
      ii. All print materials are to be directly to the school sites. The district will provide details such as specific addresses prior to shipment.

c. A detailed description of the Product, including, but not limited to, SKU, Manufacturer's item number, and any applicable designation and/or specifications which will avoid confusion regarding the Product to be delivered;
d. A detailed description of Deliverable(s) to be provided by Contractor;
e. Price, including any applicable fees and sales tax, and payment terms;
f. The scheduled delivery dates are as follows:
    i. All FOSS kits/modules by October 19, 2018; and
    ii. All print materials by November 2, 2018.
g. Contractor shall not be required to deliver any Product and/or Deliverable unless and until an Order has been provided to Contractor.

If notice of rejection of an Order is not received by District within two (2) business days from the date of its receipt by Contractor, then such Order shall be deemed to have been accepted by Contractor. By the attachment of Exhibit B to the Agreement, the District hereby submits the Order to the Contractor and the Contractor hereby accepts said Order. The details of the Order along with the Agreement shall be binding upon the Parties.

2. Amendment to Article 7 of the Agreement – The following existing language of Article 7 of the Agreement ("The Parties hereby agree that the District may pay Contractor an initial installment payment of $1,000,000 no later than September 15, 2018, and may pay Contractor a second installment payment of the balance that remains of the total $1,793,050.15 (*i.e.*, the total less the initial $1,000,000 payment) no later than September 15, 2019 for the initial Order for Products that the District placed when it adopted the FOSS Elementary Curriculum") is stricken and replaced in its entirety by the following language:

    a. "The Parties hereby agree that the District shall pay Contractor an initial installment payment of $760,000 no later than November 1, 2018; and shall pay Contractor a second installment payment of $456,525.75 no later than August 15, 2019; and shall pay Contractor a third installment payment of the balance that remains of the total $1,673,050.15 (i.e., the total less the initial two installment payments of $760,000 and $456,525.75), plus the balance due for any FOSS Kit Refurbishment Supplies that are ordered under the Purchase Agreement (which refurbishment supplies orders are not to exceed a combined total of $120,000) no later than August 15, 2020 for the Order of the Products as attached hereto. In the event that the District shall require additional Product and/or Deliverables beyond those described in the Order, it shall order same from the Contractor by the issuance of additional purchase orders which shall be governed by a separate written contract approved in advance by the District's governing body."

3. Extension of Prior Terms and Conditions – All other terms and conditions embodied in the Agreement otherwise remain unchanged.

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – The District and Delta certify to the best of their knowledge and belief that the Districts, Delta's, and their respective principals: Are not presently debarred, suspended proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or contractor according to Federal Acquisitions Regulation Subpart 9.4 and by signing this Amendment No. 1 to the Agreement, verify that this vendor does not appear on the Excluded Parties List. http://www.sam./gov.

5. Integration of Agreement and Amendment No. 1 – All understandings, agreements, covenants, and representations, express or implied, oral or written, between the Parties are contained and merged herein. No other agreements, covenants, or representations, express or implied, oral or written, have been made by or between the Parties concerning the subject of this Amendment No. 1. This is an integrated Amendment No. 1. It may not be altered, modified or otherwise changed in any respect except in writing signed by the District and Delta.

Dated: 9/18/18

**Delta Education, LLC**

By: _____

Kevin L. Baehler, Assistant Secretary

Dated: 10/25/18

**Oakland Unified School District**

By: _____

Aimee Eng, Board President

By: _____

Kyla Johnson-Trammell, Superintendent
& Board Secretary

OAKLAND UNIFIED SCHOOL DISTRICT
Office of the General Counsel
APPROVED FOR FORM AND SUBSTANCE
By: _____ 9/18/18
Michael L. Smith, Attorney at Law
Cleared 9/17/18

## Appendix A—NGSS Executive Summary

# The Next Generation Science Standards

## Executive Summary

There is no doubt that science—and, therefore, science education—is central to the lives of all Americans. Never before has our world been so complex and science knowledge so critical to making sense of it all. When comprehending current events, choosing and using technology, or making informed decisions about one's healthcare, science understanding is key. Science is also at the heart of the United States' ability to continue to innovate, lead, and create the jobs of the future. All students—whether they become technicians in a hospital, workers in a high tech manufacturing facility, or Ph.D. researchers—must have a solid K–12 science education.

Through a collaborative, state-led process, new K–12 science standards have been developed that are rich in content and practice and arranged in a coherent manner across disciplines and grades to provide all students an internationally benchmarked science education. The Next Generation Science Standards are based on the *Framework for K–12 Science Education* developed by the National Research Council.[1]

*Advances in the Next Generation Science Standards*

- Every NGSS standard has three dimensions: disciplinary core ideas (content), scientific and engineering practices, and cross-cutting concepts. Currently, most state and district standards express these dimensions as separate entities, leading to their separation in both instruction and assessment. The integration of rigorous content and application reflects how science and engineering is practiced in the real world.
- Scientific and Engineering Practices and Crosscutting Concepts are designed to be taught in context – not in a vacuum. The NGSS encourage integration with multiple core concepts throughout each year.
- Science concepts build coherently across K-12. The emphasis of the NGSS is a focused and coherent progression of knowledge from grade band to grade band, allowing for a dynamic process of building knowledge throughout a student's entire K-12 scientific education.
- The NGSS focus on a smaller set of Disciplinary Core Ideas (DCI) that students should know by the time they graduate from high school, focusing on deeper understanding and application of content.
- Science and engineering are integrated into science education by raising engineering design to the same level as scientific inquiry in science classroom instruction at all levels, and by emphasizing the core ideas of engineering design and technology applications.

[1] The performance expectations were developed using elements from the NRC document and should be cited as, *A Framework for K-12 Science Education*, © 2012, National Academy of Sciences." Moreover, the portion of the standards entitled "Disciplinary Core Ideas" is reproduced verbatim from *A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas*. They are integrated and reprinted with permission from the National Academy of Sciences. © 2012, National Academy of Sciences.

## Appendix A—NGSS Executive Summary


- The NGSS content is focused on preparing students for college and careers. The NGSS are aligned, by grade level and cognitive demand with the English Language Arts and Mathematics Common Core State Standards. This allows an opportunity both for science to be a part of a child's comprehensive education as well as ensuring an aligned sequence of learning in all content areas. The three sets of standards overlap and are reinforcing in meaningful and substantive ways.

*NGSS Design Considerations*

In putting the vision of the *Framework* into practice, the NGSS have been written as performance expectations that depict what the student must do to show proficiency in science. Science and Engineering Practices were coupled with various components of the Disciplinary Core Ideas and Crosscutting Concepts to make up the 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 the 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.

*Coupling Practice with Content*

State standards have traditionally represented Practices and Core Ideas as two separate entities. Observations from science education researchers have indicated that these two dimensions are, at best, taught separately or the Practices are not taught at all. This is neither useful nor practical, especially given that in the real world science and engineering is always a combination of content and practice.

It is important to note that the Scientific and Engineering Practices are not teaching strategies – they are indicators of achievement as well as important learning goals in their own right. As such, the *Framework* and NGSS ensure the Practices are not treated as afterthoughts. Coupling practice with content gives the learning context, whereas practices alone are activities and content alone is memorization. It is through integration that science begins to make sense and allows student to apply the material. This integration will also allow students from different states and districts to be compared in a meaningful way.

*The NGSS are Standards, not Curriculum*

The NGSS are standards, or goals, that reflect what a student should know and be able to do—they do not dictate the manner or methods by which the standards are taught. The performance expectations are written in a way that expresses the concept and skills to be performed but still leaves curricular and instructional decisions to states, districts, school and teachers. The performance expectations do not dictate curriculum; rather, they are coherently developed to allow flexibility in the instruction of the standards. While the NGSS have a fuller architecture than traditional standards—at the request of states so they do not need to begin implementation by "unpacking" the standards—the NGSS do not dictate nor limit curriculum and instructional choices.

## Appendix A—NGSS Executive Summary

*Instructional Flexibility*

Students should be evaluated based on understanding a full Disciplinary Core Idea. Multiple Scientific and Engineering Practices are represented across the performance expectations for a given Disciplinary Core Idea. Curriculum and assessment must be developed in a way that builds students' knowledge and ability toward the performance expectations. As the NGSS are performances meant to be accomplished at the conclusion of instruction, quality instruction will have students engage in several practices throughout instruction.

Because of the coherence of the NGSS, teachers have the flexibility to arrange the performance expectations in any order within a grade level to suit the needs of states or local districts. The use of various applications of science, such as medicine, forensics, agriculture, or engineering, would nicely facilitate student interest and demonstrate how scientific principles outlined in the *Framework* and NGSS are applied in real world situations.

Next Steps

With the final release of the NGSS in April 2013, states will begin their individual processes to consider adoption. The lead states are under no obligation to adopt, only to seriously consider adoption. There is no set timeline for adoption or implementation. As with all K-12 educational standards, the decision to adopt by any given state is voluntary.

| Board Office Use: Legislative File Info. | |
|---|---|
| File ID Number | 18-0276 |
| Introduction Date | 5/9/18 |
| Enactment Number | 18-0826 |
| Enactment Date | 5/9/18 er |

OAKLAND UNIFIED SCHOOL DISTRICT

Community Schools, Thriving Students

DATE: May 9, 2018

TO: Board of Education

FROM: Kyla Johnson-Trammell, Superintendent

SUBJECT: Approval of FOSS Next Generation Science Instructional Materials Adoption – Elementary and Agreement with Delta Education

**Action Requested**

Adoption by the Board of Education of Resolution No. 1718-0160 - Lawrence Hall of Science's *Full Options Science System (FOSS) Next Generation* science program for grades TK-5 and Agreement with Delta Education for the period of May 9, 2018 through June 30, 2020, in an amount not to exceed a total of $1,793,050.15 for the purchase of instructional materials related thereto.

**Background / Discussion**

The current *FOSS (Full Options Science System)* curriculum (textbooks and kits) in classrooms are based on the 1998 CA Science Standards and are outdated. California adopted the Next Generation Science Standards (NGSS) in 2013 and finalized the California Framework for the NGSS in 2016. Students will be tested on the NGSS in the 2018-2019 school year with the new California Science Test (CAST).

While the OUSD Science Department has been preparing for the full implementation of NGSS curriculum since 2012, training Science Teacher Leaders and principals in the *Next Generation* Science Standards and providing all teachers with supplemental instructional tools to support the transition to NGSS while using the old edition of FOSS, it's important that all OUSD classrooms have standards-aligned materials for science in advance of the new statewide science test.

**Selection Process**

District science leaders in the department of Teaching & Learning have concluded a 10-month process of instructional materials review with extensive participation from OUSD teachers and principals, as well as members of the community, pursuant to the requirements set forth in the California Department of Education's Implementation of Instructional Materials Not Adopted by California.

In 2016-2017, the OUSD Science Department invited three top NGSS curriculum providers to present materials at four teacher and community engagement events in four different Oakland neighborhoods. At these sessions, educators and community members from 39 of our 54 elementary schools submitted feedback on the three programs.

The data from all four curriculum review sessions show that there is overwhelming consensus and support for OUSD to adopt the new NGSS edition of the familiar and trusted FOSS curriculum. At the review sessions, both new teachers and the most experienced teachers--the Lead Science Teachers (who ultimately will be responsible for supporting new science curriculum at the site level) ranked *FOSS Next Generation* as their first choice. Of the teachers who submitted feedback, 97% ranked FOSS above the other curriculum options overall, and 100% of respondents ranked as high or higher than the other programs in every single category.

**Resulting Agreement**

The Agreement resulting from the District's adoption of the curriculum would begin May 9, 2018, in order to immediately place the required order(s) for materials to ensure availability to students prior to the beginning of the 2018/2019 school year. In addition, considering the current and anticipated budgetary situation, Delta Education has agreed that the District may pay two installment payments for all of the materials ordered as follows: $1 Million in 2018/2019 and the whatever remains of the balance of the total contract not to exceed amount of $1,793.050.15 is (*i.e.,* no more than $793,050.15) in 2019/2020.

| Board Office Use: Legislative File Info. | |
|---|---|
| File ID Number | 18-0276 |
| Introduction Date | May 9, 2018 |
| Enactment Number | 18-0826 |
| Enactment Date | May 9, 2018 er |

**RESOLUTION OF THE BOARD OF EDUCATION**
**OF THE OAKLAND UNIFIED SCHOOL DISTRICT**
**RESOLUTION NO. 1718-0160**

**SELECTION AND PURCHASE OF INSTRUCTIONAL CURRICULUM MATERIALS (FOSS NEXT GENERATION ELEMENTARY SCIENCE)**

**WHEREAS**, pursuant to Board Policy 6161.1, the Governing Board is responsible for selecting textbooks and other instructional materials for use in District schools;

**WHEREAS**, the State Board of Education has adopted the Next Generation Science Standards, has finalized the California Framework for the Next Generation Standards, and will be assessing students on the Next Generation Science Standards beginning in 2018-19;

**WHEREAS**, the Governing Board shall select instructional materials for use in grades Kindergarten through 5th grade or shall have otherwise determined which instructional materials align with the state academic content standards;

**WHEREAS**, the Governing Board shall select instructional materials for grades K-5 upon determining that the materials are:

- Aligned to applicable academic content standards;
- Are provided by publishers that comply with legal requirements;
- Do not reflect adversely upon persons because of their race or ethnicity, gender, religion, disability, nationality, sexual orientation, occupation, or other characteristic listed in Education Code 220, nor contain any sectarian or denominational doctrine or propaganda contrary to law;
- Reflective of California's multicultural society, avoid stereotyping, and contribute to a positive learning environment;
- Are accurate, objective, current , and suited to the needs and comprehension of district students at their respective grade levels;
- With the exception of literature and trade books, use proper grammar and spelling;
- Do not expose students to a commercial brand name, product, or corporate or company logo unless the Board makes a specific finding that the use is appropriate;
- Support the district's adopted courses of study and curricular goals
- Contribute to a comprehensive, balanced curriculum
- Demonstrate reliable quality of scholarship as evidenced by:
- Provide for a wide range of materials at all levels of difficulty, with appeal to students of varied interests, abilities and developmental levels
- Include materials that stimulate discussion of contemporary issues and improve students' thinking and decision-making skills

- Contribute to the proper articulation of instruction through grade levels
- Have corresponding versions available in languages other than English as appropriate
- Include high-quality teacher's guides
- Meet high publishing standards in terms of the quality, durability and appearance of paper, binding, text and graphics
- Upon adoption of standards by the SBE, not exceed maximum textbook weight standards
- Meet the standards for social content that portray in a realistic manner democratic values, cultural pluralism, and the diversity of the state's population, and emphasize people in varied, positive, and contributing roles;

**WHEREAS**, as summarized in Attachment A, instructional review committees comprised predominantly of teachers, teacher leaders and central office content specialists, with the majority of the participants being teachers, reviewed elementary instructional materials for potential use in District schools and found the following to meet the standards for adoption. Therefore, the following instructional materials are recommended for adoption by the Governing Board: *FOSS Next Generation* published by Delta Education;

**WHEREAS**, expenditures, pursuant to an Agreement between the District and Delta Education, shall not exceed the total amount of $1,793,050.15 for the period May 9, 2018 to June 30, 2020, for the purchase of elementary instructional materials related thereto:

**NOW , THEREFORE, BE IT RESOLVED** that the Board of Education hereby finds that the instructional materials listed in Attachment A meet the standards for adoption and hereby selects the instructional materials listed in Attachment A for use in District schools.

**BE IT FURTHER RESOLVED** that the Board approves the Agreement with Delta Education for the period May 9, 2018 - June 30, 2020 in an amount not to exceed a total of $1,793,050.15 for the purchase of instructional materials related thereto, which Agreement is attached as Exhibit C. The price quote issued by Delta Education, as well as its pricing lists, are attached collectively as Exhibit B, with the stated costs of purchases of the materials pursuant to the quotes and the Agreement as follows:

| Vendor | Qty | Description | Total Price |
|---|---|---|---|
| Delta Education | 916 | NGSS FOSS Kits | $1,127,623.24 |
| | 1,371 | Additional Teacher Materials (to allow rotation of kits) | $291,744.85 |
| | 1,031 | Additional Student Text Packs (to allow rotation of kits) | $87,884.30 |
| | | **Instructional Materials Subtotal** | **$1,507,252.39** |
| | | Estimated Tax and Shipping | $165,797.74 |
| | | **Total for one-time purchase of NGSS FOSS** | **1,673,050.15** |
| | | 2018-19 FOSS Kit Refurbishment Supplies | $60,000.00 |
| | | 2019-20 FOSS Kit Refurbishment Supplies | $60,000.00 |
| | | **Total for 2018 - 2020** | $1,793,050.15 |

**Passed by the following vote:**

**PREFERENTIAL AYE:** Gema Quetzal (Student Director)
**PREFERENTIAL NOE:** None
**PREFERENTIAL ABSTENTION:** None
**PREFERENTIAL RECUSE:** None
**AYES:** Jody London, Nina Senn, Roseann Torres, Vice President Jumoke Hinton Hodge
**NOES:** James Harris
**ABSTAINED:** Shanthi Gonzales
**RECUSE:** None
**ABSENT:** President Aimee Eng

**CERTIFICATION**

**We hereby certify that the foregoing is a full, true and correct copy of a Resolution passed at a Regular Meeting of the Board of Education of the Oakland Unified School District, held on May 9, 2018.**

**OAKLAND UNIFIED SCHOOL DISTRICT**

Aimee Eng

**Aimee Eng**
**President, Board of Education**

**Kyla Johnson-Trammell**
**Superintendent and Secretary, Board of Education**

OAKLAND UNIFIED SCHOOL DISTRICT
Office of the General Counsel
APPROVED FOR FORM AND SUBSTANCE
By: _____
Michael L. Smith, Attorney at Law 5/2/18

OUSD or the District verifies that the Contractor does not appear on the Excluded Parties List at https://www.sam.gov/

OUSD Science

# K-5 NGSS Curriculum Proposal

**Oakland Unified School District**

**October 2017**

*v: 6.17.17*

## Table of Contents

# K-5 NGSS Curriculum Proposal
## Executive Summary

The OUSD Science Department has been preparing for the full implementation of NGSS curriculum since 2012. In 2016-2017, the OUSD Science Department invited three top NGSS curriculum providers to present materials at four teacher and community engagement events in four different Oakland neighborhoods. At these sessions, educators and community members from 39 of our 54 elementary schools submitted feedback on the three programs. Of the 67 Oakland educators who submitted written feedback to the OUSD Science Department, 65 (97%) ranked NextGen FOSS as their first choice.

In addition to being overwhelmingly preferred by district teachers, with unprecedented consensus, FOSS has a proven record of being highly effective for teachers and students for over a decade in Oakland. We see a huge financial and operational benefit to continuing with the new NGSS-edition of FOSS, since

(1) OUSD already owns hundreds of thousands of dollars of hands-on materials that would not have to be re-purchased,

(2) OUSD has the operational capacity and infrastructure to support materials distribution and maintenance, and

(3) All 54 elementary sites in OUSD have the instructional capacity through Science Teacher Leaders to support a smooth transition to the new edition of a familiar and trusted curriculum, which will enable teachers to quickly move from base level implementation to high-level, data-driven instruction in science.

As such, it is the professional recommendation of the OUSD Science Department to pilot only the NextGen FOSS curriculum in a select number of schools during the 2017-2018 school year with the intent to submit NextGen FOSS to the OUSD Board of Trustees for adoption in 2017-2018 and district-wide implementation in 2018-2019.

## Background

For nearly a decade, the Oakland Unified School District's Science Department has developed to become a national leader in urban science education. The science department focuses on nurturing students' curiosity and scientific understanding of our world in order to address personal, community and global issues. Over the course of the last ten years we have:

- Helped 1000 Teachers implement a science curriculum each year
- Facilitated collaborative learning for 70 site-based teacher leaders per year
- Presented over 30 workshops at state and national conferences
- Hosted 600 district leaders from over 50 school districts at three annual NGSS Symposiums
- Developed training and observation materials for district teachers and principals

At the core of the Elementary Science Program has been the Full Option Science System (FOSS), developed at the Lawrence Hall of Science and adopted by the Oakland Unified School District in 2008. Originally developed as a program for visually and hearing impaired students, FOSS is a research-based, award-winning science curriculum that has served children across the nation for over 40 years. The FOSS Program bridges research and practice by providing tools and strategies to engage students and teachers in enduring experiences that lead to deeper understanding of the natural and designed worlds.

With support from the S.D. Bechtel Jr. Foundation, a complex operational system has been established to the support the implementation of the FOSS curriculum--including 2 cargo vans, a warehouse, 3,600 boxes of materials, teacher leaders from every elementary school, and a central Science Department. Each year over 10,000 human hours are spent refurbishing and moving FOSS kit boxes between schools and the SMART Center warehouse to ensure every child in every classroom in OUSD has the materials they need for hands-on science.

The edition of FOSS currently used in OUSD schools is aligned to the 1998 California Science Standards. Since the adoption of FOSS in 2008, two newer editions of FOSS have been published, including NextGen FOSS--aligned to the Next Generation Science Standards.

## Next Generation Science Standards

Since 2011, the year that the Framework for K-12 Science Education was released by the National Research Council (NRC) of the National Academy of Science, the OUSD Science Department has been preparing for the transition of our schools to the Next Generation Science Standards (NGSS). (See Appendix A—NGSS Executive Summary.)


The NGSS call for major shifts in the way science is experienced by K-12 students. They include:

1. Connecting and applying science to the real world
2. Aligning with Common Core State Standards
3. Building coherently, K-12
4. Integrating science and engineering
5. Engaging students in "three-dimensional learning" in which students apply the three dimensions of the NGSS--the Disciplinary Core Ideas, the Science and Engineering Practices, and the Crosscutting Concepts--to understanding phenomena.

The OUSD Science Department began the transition by analyzing the shifts in the NGSS and determining which shifts are dependent on having new curricular materials and which could be implemented using the current curriculum, the Full Option Science System (FOSS) developed at the Lawrence Hall of Science and adopted as the K-5 science curriculum in OUSD in 2008.

A theory of action was developed for transitioning schools to the Next Generation Science Standards. The transition plan would take place in three phases.

| Phase 1: Initiation (2011-2013) | Phase 2: Transition (2013-2017) | Phase 3: Implementation (2017-Future) |
|---|---|---|
| Introduce Science and Engineering Practices to Teacher Leaders, Principals, and Cohort/Focus schools | Implement *most* Science and Engineering Practices using FOSS and SIRA | Implement *all* Science and Engineering Practices with NGSS curriculum |
| | Introduce *some* Disciplinary Core Ideas where possible through the SIRA and 2007 Edition of FOSS | Fully implement *all* Disciplinary Core Ideas with NGSS curriculum |
| | Introduce Crosscutting Concepts to Teacher Leader and Principals, and include in the SIRA, where possible. | Implement *all* Crosscutting Concepts with NGSS curriculum |

## OUSD K-5 NGSS Implementation Timeline

| Date | California | OUSD Science |
|---|---|---|
| 2011 | | OUSD Science Department analyzes the Framework for K-12 Science Education and develops initial NGSS transition plan |
| 2012 | | Teacher leaders, principals, and cohort/focus schools engage in NGSS learning with a focus on the Science & Engineering Practices |
| 2013 | California adopts NGSS as new K-12 science standards | OUSD joins NGSS Early Implementation Initiative of the K-12 Alliance, a WestEd program, with 9 districts from across California<br>OUSD NGSS Core Leadership Team forms (K-8 principals, teachers, T&L staff)<br>SIRA 3rd grade developed & piloted |
| 2014 | CA NGSS Framework Committee Developed | SIRA 3rd grade implemented district-wide<br>SIRA 4th grade developed & piloted |
| 2015 | | SIRA grades 3-4 implemented district-wide<br>SIRA 5th Grade developed & piloted |
| 2016 | CA NGSS Framework Finalized | K-2 SIRA Elements developed & piloted<br>CLTs from 9 participating districts in the Early Implementation Initiative met to review curriculum from 8 publishers<br>Teachers on CLTs pilot full units of NGSS curriculum |
| 2017 | CAST Assessment Pilot (5th, 8th, HS) | Open Forum held for all OUSD teachers to review curriculum materials<br>Selected program(s) field tested |
| 2018 | CAST Assessment Field Test (5th, 8th, HS) | OUSD adopts NGSS curriculum<br>Science Department prepares for reorganization of the SMART Center warehouse, prepares NGSS-aligned assessment plan, and develops professional learning plan for all K-5 teachers |
| 2019 | CAST Assessment Implementation (5th, 8th, HS) | NGSS curriculum implemented district-wide |

## NGSS Implementation: Initiation (2011-2012)

First, the OUSD Science Department would build capacity and develop tools to support the implementation of two of the three dimensions of the NGSS--the Science and Engineering Practices and the Crosscutting Concepts--by layering them onto the existing FOSS curriculum.

This would be achieved with three levers:

1. Teacher Leadership
2. Principal Training
3. In-depth support of Cohort/Focus Schools

From 2007-2017 Teacher Leaders from every site have attended monthly or bimonthly meetings with the Science Department, in which they engage in science learning--both content and pedagogy of the NGSS--leadership development, and logistical support. (See Appendix B.)

Beginning in 2011, Principals learned about the shifts in NGSS through extensive professional learning conducted by the science department. (For an overview of the 30 hours of principal professional learning in 2011-2012, see Appendix C.) Since that time, professional learning has been ongoing, and has broadened to include Learning Walks in which principals look for observable indication of NGSS-aligned instruction using the 5 x 9 card introduced in 2012 (see Appendix D), or the NGSS Transitional Standards and Principal Toolkit introduced in 2017 (see Appendix E.)

To support deep implementation of the NGSS, the Science Department would provide intensive support--classroom coaching, leadership support, and ongoing professional development--to groups of schools across the district. Thirteen schools participated in the Science and Literacy Cohort from 2012-104. (See Appendix F.) Eight schools participated as Science Focus Schools in 2014-2015. (See Appendix G.)

## NGSS Implementation: Transition (2013-2017)

Beginning in 2013, with support from the S.D. Jr. Bechtel Foundation, the Science Department began developing tools to introduce all three dimensions of the Next Generation Science Standards, in part, to every classroom in OUSD. These tools came to be known as the Science Instructional Reflection and Assessment (SIRA).

### SIRA

The Science Instructional Reflection and Assessment (SIRA) was designed as a transition strategy to prepare elementary teachers and students for the exciting shifts of the newly adopted Next Generation Science Standards (NGSS). Developed by OUSD's Elementary Science Team in partnership with veteran OUSD teachers, the SIRA is an instructional sequence that helps focus and deepen the teaching of FOSS science modules, while emphasizing the Science Practices called for in NGSS. The SIRA is anchored by clear learning goals, encourages frequent formative assessment, and leads to a concise summative assessment for FOSS science modules. The SIRA is to be used hand-in-hand with our current FOSS modules. (See Appendix H.)

Through the creation and implementation of the SIRA, the OUSD Science Department and OUSD teachers engaged in learning and implementation of some of the dimensions of the Next Generation Science Standards. The SIRA instructional plans layered the Science and Engineering Practices and Crosscutting Concepts of the NGSS onto the existing FOSS curriculum.

The SIRA begins with a conceptual framework that tightly outlines the most important science ideas, science practices, and crosscutting concepts addressed in a particular FOSS module. This map serves as the anchor for subsequent sections of the SIRA. The conceptual framework contains our NGSS Transitional Standards. The science ideas (Big Idea and Supporting Concepts) in the SIRA conceptual framework are derived from the 1998 CA Science Standards, since the FOSS kits that teachers have in their classrooms are based on these standards. To use the core ideas from NGSS would require grade levels to obtain new materials tied to those ideas. Until we adopt new NGSS-aligned curriculum, we will use our current FOSS kits, teach the ideas/content from those kits, and fold in the NGSS science practices and crosscutting concepts through the SIRA.

As such, the SIRA serves as a transition tool and does not support *full* implementation of the Next Generation Science Standards. Full implementation of the new standards requires adoption and implementation of new NGSS-aligned curriculum.

**Selection of NGSS Curriculum Options**

In addition to the development of the SIRA, in 2013 the OUSD Science Department joined with nine other districts across California in the NGSS Early Implementation Initiative, a multi-year project of the K-12 Alliance to support the implementation of the NGSS.

Through this collaboration, the Science Department assembled an NGSS Core Leadership Team (CLT) comprised of district leaders, principals, and teachers who would create a multi-faceted, multi-year NGSS Implementation Plan, which was approved by Superintendent Antwan Wilson in 2015. (See Appendix I.) Part of the work of the CLT has been to participate in NGSS curricula review with the CLTs from the other nine participating districts.

In January 2016, CLT members from all participating districts heard presentations and reviewed materials from eight major publishers of NGSS curriculum programs. They were:

1. AMNH (American Museum of Natural History)
2. Amplify
3. NextGen FOSS
4. Gizmos-ExploreLearning
5. IQWST, Activate Learning
6. National Geographic
7. STC, Smithsonian Science Education
8. STEMscopes

In Spring 2016, classroom teachers on the Core Leadership Teams of all nine districts piloted full units from the eight programs in their classrooms. Feedback was collected by the K-12 Alliance and shared with participating districts for the purposes of informing local curricula selection processes. The three top-rated programs were invited to Oakland for curriculum review. The three programs represented were Amplify Science from the Lawrence Hall of Science, NextGen FOSS from the Lawrence Hall of Science, and STEMscopes from Rice University.

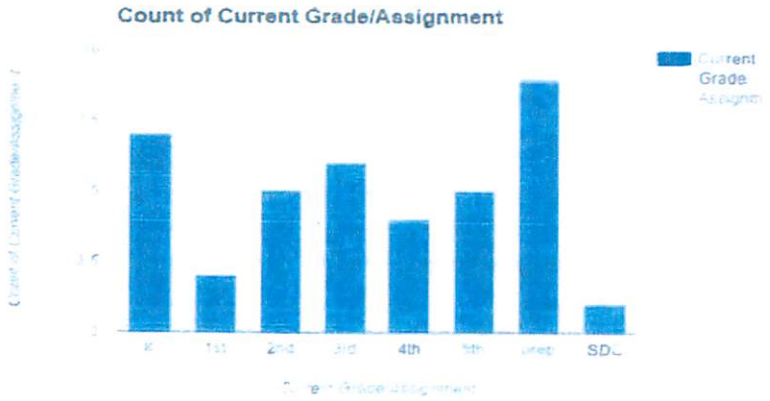
All three programs are aligned to the Next Generation Science Standards, include hands-on learning, and utilize Science Notebooks for student. All three programs are affiliated with University-based research institutions.

## Curriculum Review Session

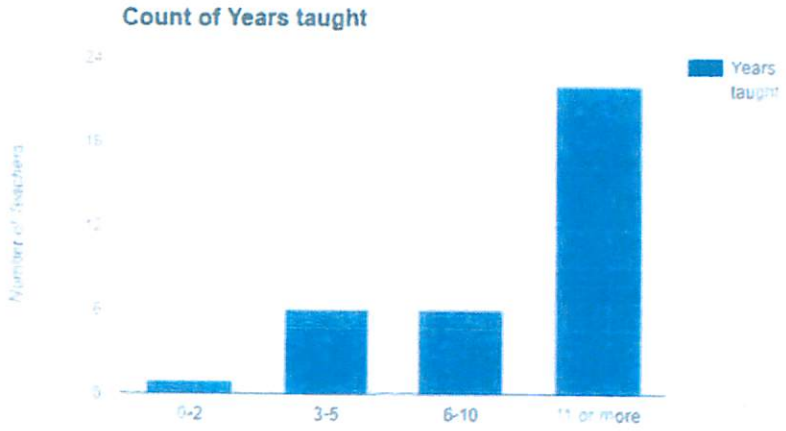
In May 2017, representatives from the top three programs for grades K-5 were invited to present to a public forum of OUSD teachers. All three publishing companies flew representatives to Oakland to present their full curriculum to OUSD teachers, including hands-on materials, teacher guides, student books, and online resources.

Electronic and paper fliers were distributed to all teachers at all 54 elementary school sites through the Lead Science Teacher. (See Appendix J.) Initial notices were sent out over a month in advance, with follow-up reminders one and two weeks before.

The event was attended by 42 teachers from 38 different schools, or 72% of schools in the district. There were teachers representing every grade, K-5 including special education teachers.



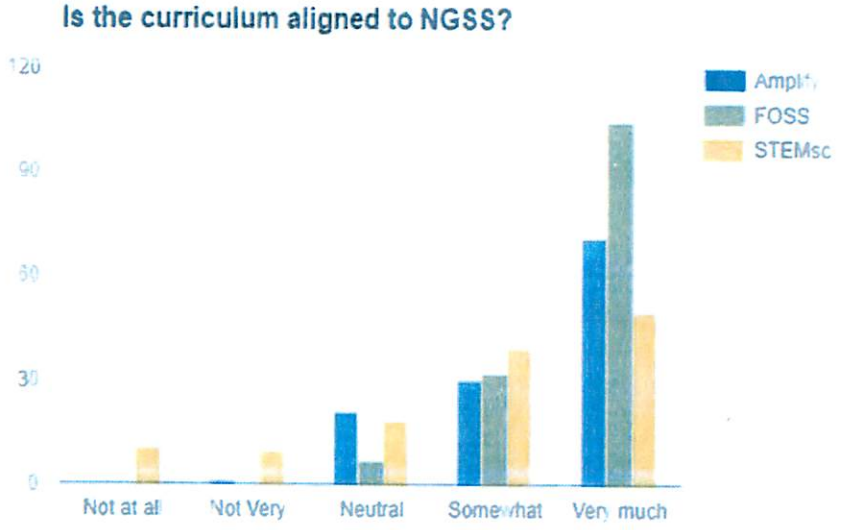

Over half of the teachers in attendance have taught in OUSD for 10 or more years. 42 teachers in attendance, 40 currently serve as the Lead Science Teacher at their site. The Lead Science Teachers are the people primarily responsible for supporting site-level implementation of science through the areas of advocacy, collaboration, modeling, and providing resources.



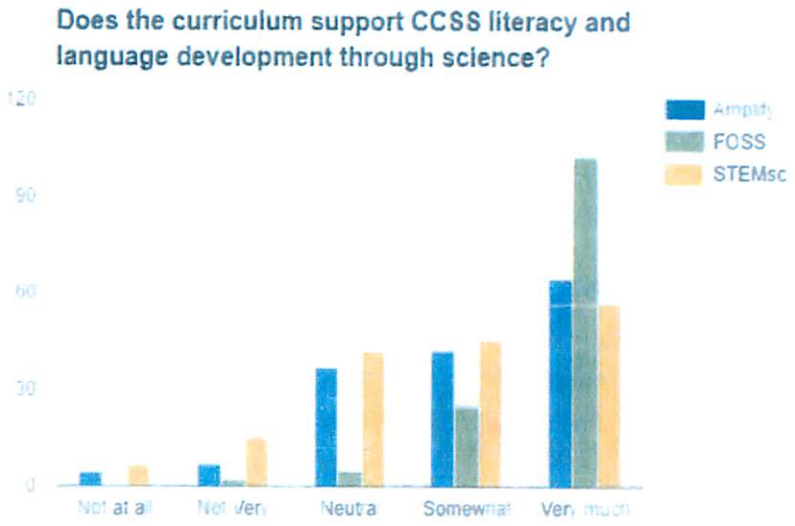
The teachers each heard presentations from all three curriculum providers and had the opportunity to review instructional materials for each program. Feedback was collected on a feedback form designed by the OUSD Science Department. The feedback form is informed by the EQuip rubric for NGSS materials published by Achieve (see Appendix K) and the mission and vision of OUSD Science (see Appendix L).

This feedback form had teachers rate programs in six different areas: (1) NGSS Alignment, (2) Language, Literacy, and Common Core Connections, (3) Equity, (4) Student Materials, (5) Assessment, (6) Usability. (See Appendix M.) Teachers were given hard copies of the feedback forms for the purpose of note-taking during the presentations by the curriculum providers. Final feedback was collected electronically.

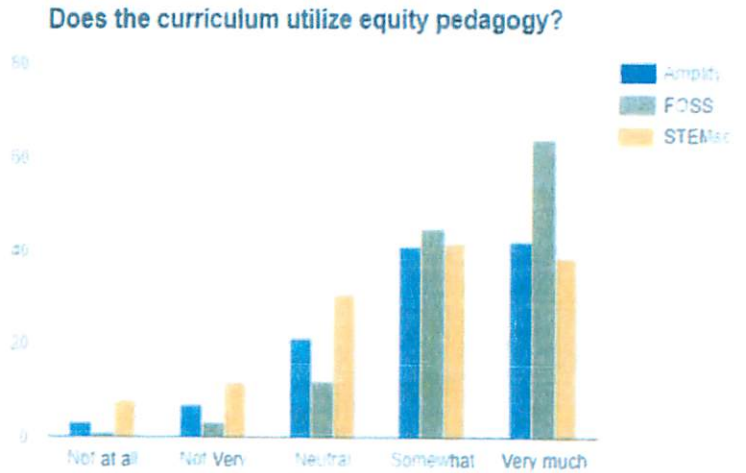
In the category of NGSS Alignment, teachers were asked to rank the programs on a scale of 1-5 with the following questions: Does the curriculum provide experiences with phenomena that support deep conceptual learning? Does the curriculum have students discussing open-ended questions that focus on the strength of the evidence used to generate claims? Are Science & Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts woven together so that student tasks reflect the ways that real scientists do and think about science? Is there a clear Scope and Sequence or Concept Map that shows NGSS learning progressions? On all questions in the category of NGSS alignment, NextGen FOSS was rated the highest.



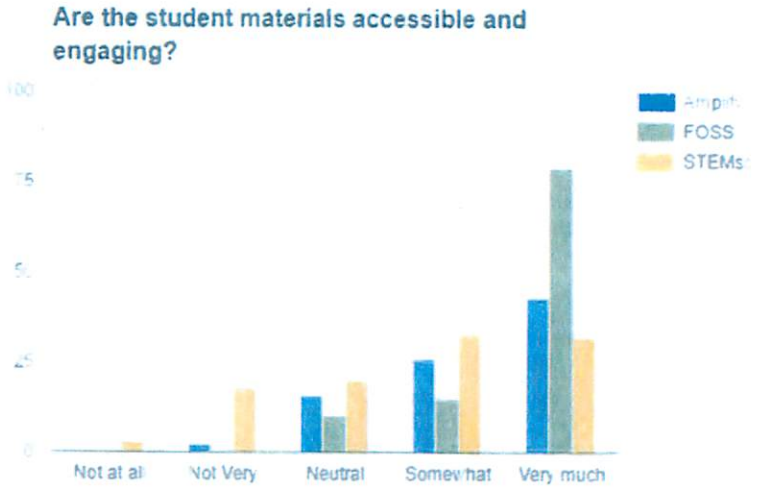
In the category of **Language, Literacy, and Common Core Connections** teachers were asked: Does the curriculum include embedded supports for language development? Are there frequent opportunities to write in Science Notebooks for a variety of purposes, such as collecting data, developing, using, and revising models, constructing explanations based on evidence, and reflecting on their learning? Does the curriculum include frequent opportunities for students to engage in discussion and argumentation to make sense of data and deepen their understanding? Will students read complex text *after* their investigations to deepen their understanding? Does the curriculum provide supports for mathematical thinking & data analysis? On all questions, NextGen FOSS was rated the highest.



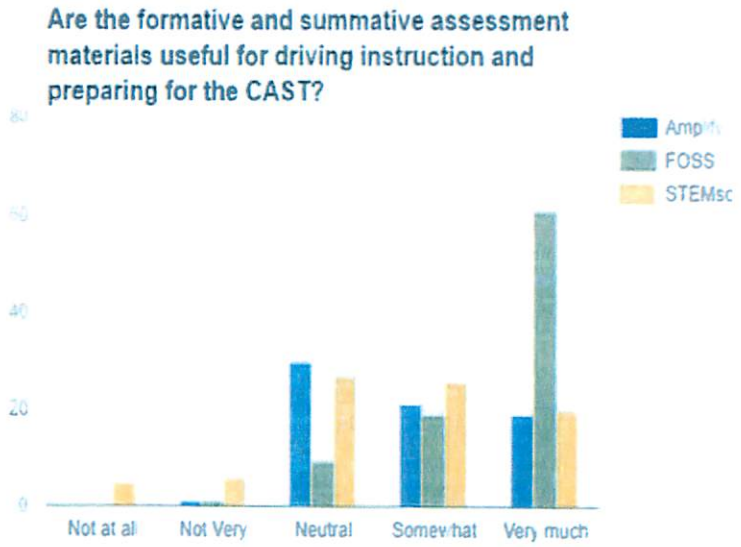

In the category of **Equity Pedagogy**, teachers were asked the following: Do the learning experiences hook into students' prior knowledge? Do the learning experiences seem relevant to the lives of the students you teach? Do the print materials reflect the diversity of our school communities? Are student materials available in languages other than English? NextGen FOSS was rated the highest.



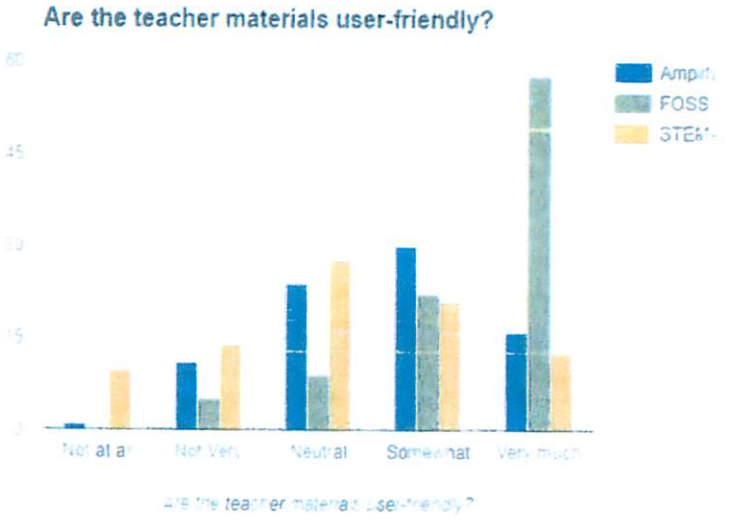
In the category of **Student Materials,** teachers were asked: Will all students be able to access the materials? Does the curriculum include traditional tools of science (e.g. hand lenses and measuring devices) and common objects so that students can see opportunities for science in their everyday lives? Do the reading materials allow students to build on ideas from their hands-on experiences? NextGen FOSS received the highest marks in this category by Oakland teachers.



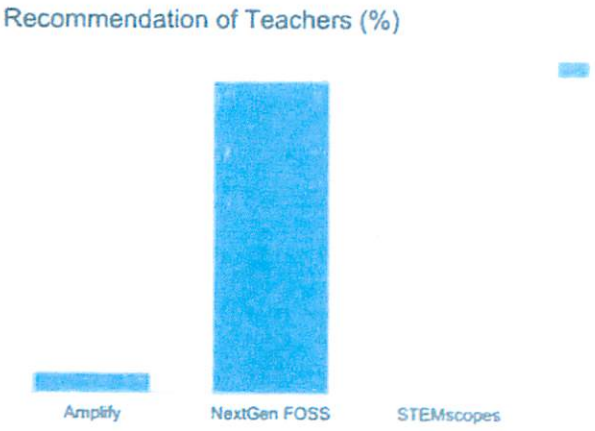

In the category of **Assessment**, teachers were asked: Do the assessments (formative and summative) provide information about both conceptual understanding and skills (e.g. Science and Engineering Practices)? Does the curriculum provide guidance for how to use the assessment data? Are the summative assessments easily administered (e.g. within one session)? OUSD teachers ranked NextGen FOSS as having the strongest and most usable assessment program.



In the final category of **Usability**, teachers were asked: Are the teacher materials user-friendly? Do you think you could use the teacher materials without having had any training? Are the teacher materials available in languages other than English? Teachers again ranked NextGen FOSS the highest of any program. However, in this category FOSS received some lower marks since, although student materials are all available in English and Spanish, the Teacher Guides are only available in English. This presents a challenge for teachers providing science instruction in Spanish.




Overall, of the teachers who reviewed the programs, 94% recommended NextGen FOSS for adoption by OUSD, 6% recommended Amplify for adoption by OUSD, and 0% recommended STEMscopes for adoption by OUSD.



Some comments from teachers were:

- I like FOSS and it seems as if the changes made go along with many of the practices that we have been trying to do- more note booking, discussions, more outdoor science, and more engineering. The program emphasizes hands-on experiences which is important for concept building.

- I really like that FOSS is easy for teachers and students to access. They are direct and to the point. The hands on activities are versatile and lend themselves to a lot of questioning, talking, and writing.

- The new revisions in the new Foss are relevant and inclusive of all learners, in particular English language Learners.

- FOSS, FOSS, FOSS! :0)

- I want to pilot the Spanish version at my site.

- I think FOSS aligns very well with our vision of science education in Oakland. The focus questions, investigations and notebooking are excellent. I am excited about the increased outdoor education, and EL notes in each lesson, and the next steps after you assess students.

**Community Engagement Sessions**

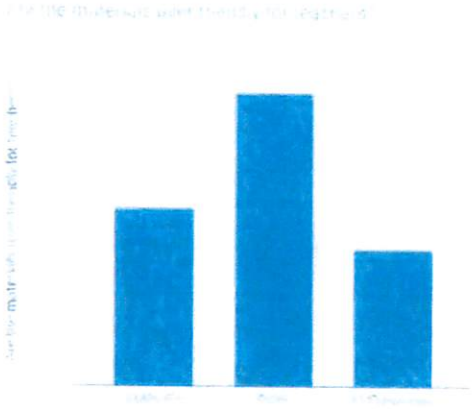
In June, three additional community engagement sessions were held to engage more teachers and community members and ensure that feedback was gathered from teachers who are not the site Lead Science Teacher and may not have had extensive science training or familiarity with NGSS. The first session was held on the Stonehurst campus of Esperanza Elementary and Korematsu Discovery Academy in East Oakland. The second session was held in central Oakland at Crocker Highlands. The third session was held in West Oakland at Hoover Elementary. In total, 25 teachers and community members attended, including teachers, principals, volunteers, and a literacy coach.

A modified feedback form was used to collect more summative feedback, with a focus on usability by teachers and students. These events were publicized through the OUSD communications department in order to reach all stakeholders. (See Appendix N.)

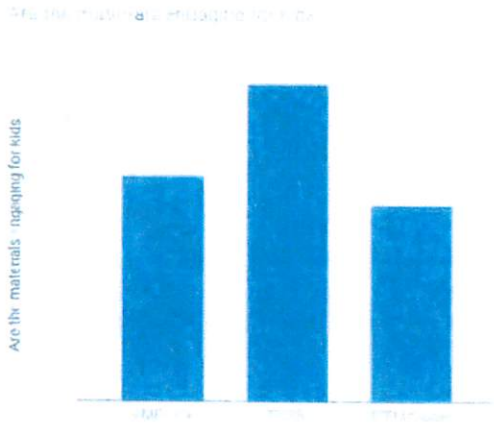
At these sessions, instructional materials (both teacher-facing and student-facing materials) from Amplify, NextGen FOSS, and STEMscopes were on display. The materials displayed all corresponded to the same specific grade-level and standards, for ease of comparison. Additionally, at all sites a Chrome book cart was made available so that participants could view the online materials for all grade levels, K-5. (See Appendix O for login information.) A simplified feedback form was provided in English and Spanish, with an emphasis on accessibility for teachers and students. (See Appendix P.)

In total, twenty-six individuals attended the events. The majority were classroom teachers. (See Appendix Q for sign-in sheets.) Some participants came specifically to see the new FOSS instructional materials. Of those participants who completed the feedback form, **100% ranked NextGen FOSS as their top preference.**

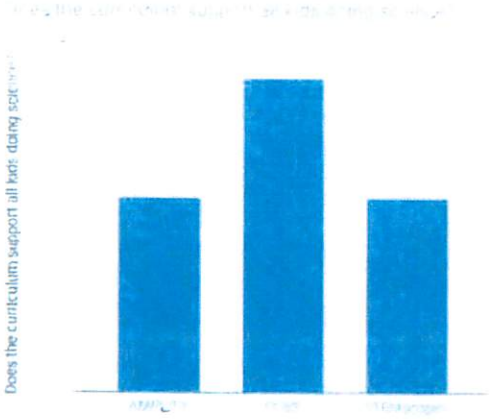
When asked to rate the Amplify, FOSS, and STEMscopes on whether the materials were user-friendly for teachers on a scale of 1 - 5, FOSS was rated the highest.



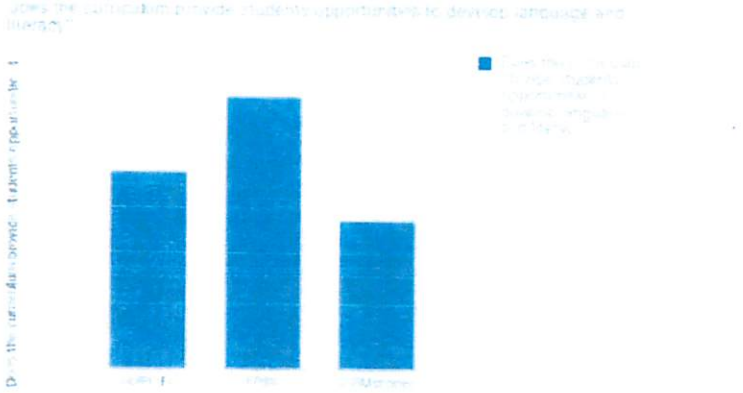
When asked how engaging the materials looked for students on a scale of 1 - 5, FOSS was rated the highest.



When asked how well the curriculum would support all students on a scale of 1 - 5, FOSS was rated the highest.



When asked how well the curriculum would provide students with opportunities to develop language and literacy through science on a scale of 1 - 5, FOSS was rated the highest.



One teacher said on the feedback form of FOSS, "I like the continuity. I like the [teacher] guides. I like the student textbooks." Another teacher said about FOSS, "New layout of the teacher's guide is really nice--much more concise and usable."

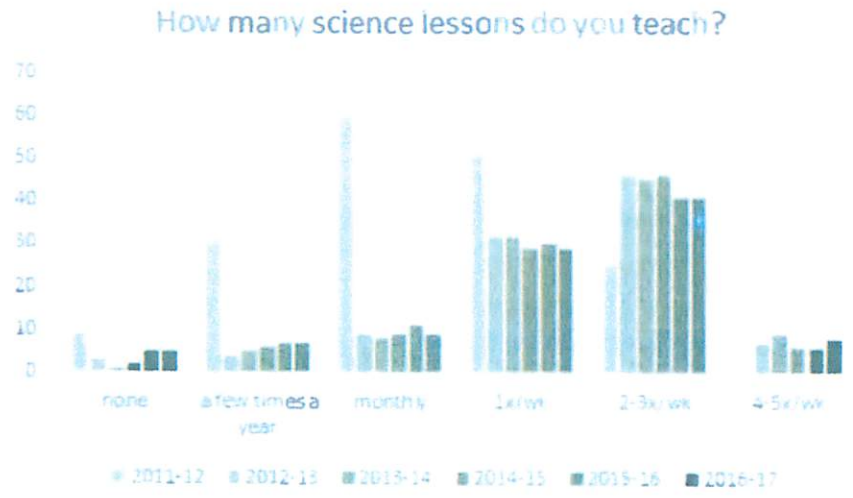
## Analysis

### Teacher Feedback

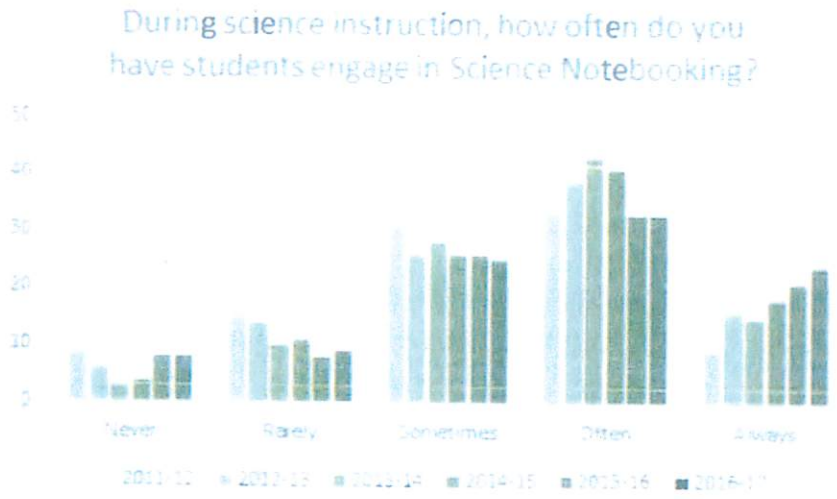
The data from all four curriculum review sessions show that there is overwhelming consensus and support for OUSD to adopt the new NGSS edition of the familiar and trusted FOSS curriculum. At the review sessions, both new teachers and the most experienced teachers--the Lead Science Teachers (who ultimately will be responsible for supporting new science curriculum at the site level) ranked NextGen FOSS as their first choice. Of the teachers who submitted feedback, 97% ranked FOSS above the other curriculum options overall, and 100% of respondents ranked as high or higher than the other programs in every single category.

### Quality

For over a decade FOSS has been instrumental in increasing both the quantity and quality of science instruction for Oakland students. To determine the quantity of science instruction taking place in OUSD elementary classrooms, the Science Department has been collecting data through an annual teacher survey. The anonymous surveys are collected by the Lead Science Teachers at each site, with an annual response rate of 60% - 70% of all elementary teachers each year. Since 2011, the amount of students receiving science 3-5 times per week has steadily increased, while the amount of students receiving science once a week or less has decreased.



One indicator of quality of science instruction is how often students engage in Science Notebooking, a foundational pedagogical practice for student meaning-making, developing evidence-based writing, and providing teachers with timely formative assessment data. Since 2011, the amount of students engaging in Science Notebooking has steadily increased, with over a quarter of elementary students always engaging in the practice during science instruction.




In addition to the history of effectiveness of the older edition of the FOSS curriculum in Oakland, the new NGSS edition of FOSS has won critical acclaim across the country. In 2016 the Association of American Publishers (AAP) awarded FOSS Next Generation K–5 Edition won both the 2016 AAP REVERE Award for Whole Curriculum—Science as well as the 2016 AAP REVERE Golden Lamp Award for best Whole Curriculum overall, from any content area.

NextGen FOSS is not just the most preferred curriculum by Oakland teachers, it is also the highest quality curriculum for the Next Generation Science Standards, according to the Association of American Publishers.

**Cost Estimates**

Apart from quality, FOSS is the top choice when considering implementation logistics. Given the current investment in FOSS, including hundreds of thousands of dollars of hands-on materials housed at the SMART Center, NextGen FOSS is the most economical option.

**NGSS Curriculum Materials**
**Cost Estimates for 8 Year Adoption***

| | New Adoption (No Rotation) | New Adoption (Rotation) | Upgrade from Current Curriculum (Rotation) | Annual Materials Replenishment | Annual License Fees | Total Cost for 8 year Adoption |
|---|---|---|---|---|---|---|
| Amplify | 2,883,150 | N/A | N/A | Costs unknown at this time | 132,300 | 3,809,250 |
| NextGen FOSS | 2,741,770 | 1,533,014 | 942,713 | 50,000 | none | 1,292,713 |
| STEMscopes | 1,041,245 | N/A | N/A | 370,550 | 147,150 | 4,665,145 |

* Not included: SMART Center Clerk, van maintenance, SMART Center Interns, Live Organisms, training costs

When looking at implementation costs, there are both the one-time costs for adoption materials (materials kits, student books, and teacher guides) and ongoing costs (materials replenishment and licensing fees for online resources.)

The first column "New Adoption" shows the costs of purchasing a full set of all materials for every classroom in Oakland. Numbers are based on 2017 classroom counts and list prices from all three publishers. (See Appendix R for Pricing Information.)

The second column, "New Adoption (Rotation)," shows the cost of purchasing materials to rotate between schools. The FOSS curriculum is divided into three units, or "FOSS kits," per year at all grade levels K-5. Rather than purchasing all three kits for every class—which would require significant on-site storage, the OUSD purchased between 1/3 and 1/2 of the number of kits needed, which are shared between sites. In any given trimester, 1/3 of the 54 elementary schools in Oakland are using the Life Science kits, 1/3 are using the Physical Science kits, and 1/3 of the schools are using the Earth Science kits. Each trimester, the Science Department spends two full weeks moving kits from one school to another, known as "FOSS Rotation." (See Appendix S for a sample FOSS Rotation Schedule.)

Every summer, all FOSS kits—approximately 3,600 boxes of materials—are returned to the SMART Center for refurbishments. A team of 10 OUSD high school students are employed as SMART Center Interns through the ECCO program of the Linked Learning Department. These students work eight hours a day for eight weeks in the summer in order to prepare all kits for use in the next school year.

The FOSS rotation system has been successfully implemented in OUSD for the last 10 year. The FOSS rotation system reduces the amount of money needed for curriculum adoption as well as ensures that materials will be replenished each year so that all students in every school will have the opportunity to engage in hands-on science throughout the length of the adoption.

While the amount of science instruction for Oakland students has steadily increased since the first adoption of FOSS in 2008 (see graph on p. 16), districts without central systems for materials refurbishment have reported steady decreases in the amount of hands-on science taking place in classrooms in the years following the initial adoption of materials, as sites have varied capacities to maintain the materials.

The adoption cost for NextGen FOSS, with a commitment to maintain a central refurbishment system) is $1,208.756 less than an adoption of FOSS without rotation. It is also less than the costs of its competitors. A rotation system is not an option with STEMscopes, which uses one large materials kit per year, or Amplify, which has different numbers of kits in different grade levels.

An additional for NextGen FOSS is the purchase of "Conversion Kits" which can be purchased to upgrade existing FOSS kits. The "Conversion Kits" include new Teacher Guides, new student books, and materials that were not part of previous editions. This would allow OUSD to continue using the equipment previously purchased by OUSD, such as hand lenses, graduated cylinders, thermometers, etc. This would allow OUSD to save an additional $590,301.

**Recommendation**

Furthermore, by continuing with FOSS, our Oakland teachers will be able to build upon their experience with the FOSS curriculum, so that implementation efforts at the site and district level can quickly move past base level implementation (e.g. how to use the teacher guide and how to access online resources) and instead move into higher level professional development, such as analyzing student writing in science and leveraging opportunities for literacy and language development.

For all of these reasons: (1) teacher buy-in, (2) quality, (3) cost, and (4) implementation logistics, it is the recommendation of the OUSD Science Department to proceed with the adoption and implementation of the NextGen FOSS curriculum in all K-5 classrooms.

## NGSS Implementation: Implementation (2017-2019)

In order to support all students for success on the California Science Test (CAST), the new State assessment of the NGSS, it is essential that classrooms receive NGSS-aligned curriculum in the 2018-2019 school year, in advance of the first operational administration of the CAST. (For details on the CAST, see Appendix T.)

The OUSD Science Department proposes spending the 2017-2018 school year preparing to transition all 54 schools to the NextGen FOSS curriculum.

**NGSS Pilot Cohort**

We intend to work with a small, dedicated cohort of schools to field test the NextGen FOSS modules for the full 2017-2018 school year and provide feedback to the Science Department on matters of instructional time, assessment recommendations, and professional development. We intend to find schools that represent the diversity of Oakland--schools in all regions of Oakland, schools with high numbers of new teachers and schools with a majority of returning teachers, general education teachers and special education teachers, teachers who instruct in English to English Learners and teachers who instruct in Spanish in dual-language programs. We plan to select schools that are willing to dedicate more instructional time to teaching science than the 2010 Board Policy requires in order to meet the Next Generation Science Standards. We plan to select schools that are willing to dedicate significant professional development time to collaboration and learning around the new standards and curriculum, including a cycle of inquiry on science in the first trimester, PLCs dedicated to science each month, and spending the full October Professional Development day with other schools in the NGSS Cohort. (For full description of the Pilot Cohort, see Appendix U.)

Information about the NGSS Pilot Cohort was distributed to all elementary principals in the last weeks of the 2016-2017 school year. The application required commitment to the aforementioned agreements around instructional and professional development time as well as consensus from the teaching staff. With less than two weeks to apply, 25% of OUSD elementary schools applied to be in the cohort, signifying overwhelming interest in transitioning to the Next Generation Science Standards with new FOSS materials.

Although not all 25% of schools can be included in the NGSS Pilot Cohort due to limited resources, all 54 elementary schools will benefit. Through this field test, additional information will be collected by a larger group of teachers and principals.

This information will either inform a recommendation to the OUSD Board of Trustees in Winter 2017 for adoption of the NextGen FOSS curriculum for the 2018-2019 school year, as well as provide essential information to the OUSD Science Department to prepare materials, assessments, and professional development district-wide in 2018-2019.

For additional information, please contact Elementary Science Coordinator Brenda Tuohy at Brenda.Tuohy@ousd.org.

## Appendix A—NGSS Executive Summary

# The Next Generation Science Standards

## Executive Summary

There is no doubt that science—and, therefore, science education—is central to the lives of all Americans. Never before has our world been so complex and science knowledge so critical to making sense of it all. When comprehending current events, choosing and using technology, or making informed decisions about one's healthcare, science understanding is key. Science is also at the heart of the United States' ability to continue to innovate, lead, and create the jobs of the future. All students—whether they become technicians in a hospital, workers in a high tech manufacturing facility, or Ph.D. researchers—must have a solid K–12 science education.

Through a collaborative, state-led process, new K–12 science standards have been developed that are rich in content and practice and arranged in a coherent manner across disciplines and grades to provide all students an internationally benchmarked science education. The Next Generation Science Standards are based on the *Framework for K–12 Science Education* developed by the National Research Council.[1]

*Advances in the Next Generation Science Standards*

- Every NGSS standard has three dimensions: disciplinary core ideas (content), scientific and engineering practices, and cross-cutting concepts. Currently, most state and district standards express these dimensions as separate entities, leading to their separation in both instruction and assessment. The integration of rigorous content and application reflects how science and engineering is practiced in the real world.
- Scientific and Engineering Practices and Crosscutting Concepts are designed to be taught in context – not in a vacuum. The NGSS encourage integration with multiple core concepts throughout each year.
- Science concepts build coherently across K-12. The emphasis of the NGSS is a focused and coherent progression of knowledge from grade band to grade band, allowing for a dynamic process of building knowledge throughout a student's entire K-12 scientific education.
- The NGSS focus on a smaller set of Disciplinary Core Ideas (DCI) that students should know by the time they graduate from high school, focusing on deeper understanding and application of content.
- Science and engineering are integrated into science education by raising engineering design to the same level as scientific inquiry in science classroom instruction at all levels, and by emphasizing the core ideas of engineering design and technology applications.

[1] The performance expectations were developed using elements from the NRC document and should be cited as, *A Framework for K-12 Science Education*, © 2012, National Academy of Sciences." Moreover, the portion of the standards entitled "Disciplinary Core Ideas" is reproduced verbatim from *A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas*. They are integrated and reprinted with permission from the National Academy of Sciences. © 2012, National Academy of Sciences

## Appendix A—NGSS Executive Summary


- The NGSS content is focused on preparing students for college and careers. The NGSS are aligned, by grade level and cognitive demand with the English Language Arts and Mathematics Common Core State Standards. This allows an opportunity both for science to be a part of a child's comprehensive education as well as ensuring an aligned sequence of learning in all content areas. The three sets of standards overlap and are reinforcing in meaningful and substantive ways.

*NGSS Design Considerations*

In putting the vision of the *Framework* into practice, the NGSS have been written as performance expectations that depict what the student must do to show proficiency in science. Science and Engineering Practices were coupled with various components of the Disciplinary Core Ideas and Crosscutting Concepts to make up the 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 the 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.

*Coupling Practice with Content*

State standards have traditionally represented Practices and Core Ideas as two separate entities. Observations from science education researchers have indicated that these two dimensions are, at best, taught separately or the Practices are not taught at all. This is neither useful nor practical, especially given that in the real world science and engineering is always a combination of content and practice.

It is important to note that the Scientific and Engineering Practices are not teaching strategies -- they are indicators of achievement as well as important learning goals in their own right. As such, the *Framework* and NGSS ensure the Practices are not treated as afterthoughts. Coupling practice with content gives the learning context, whereas practices alone are activities and content alone is memorization. It is through integration that science begins to make sense and allows student to apply the material. This integration will also allow students from different states and districts to be compared in a meaningful way.

*The NGSS are Standards, not Curriculum*

The NGSS are standards, or goals, that reflect what a student should know and be able to do—they do not dictate the manner or methods by which the standards are taught. The performance expectations are written in a way that expresses the concept and skills to be performed but still leaves curricular and instructional decisions to states, districts, school and teachers. The performance expectations do not dictate curriculum; rather, they are coherently developed to allow flexibility in the instruction of the standards. While the NGSS have a fuller architecture than traditional standards—at the request of states so they do not need to begin implementation by "unpacking" the standards—the NGSS do not dictate nor limit curriculum and instructional choices.

## Appendix A—NGSS Executive Summary

*Instructional Flexibility*

Students should be evaluated based on understanding a full Disciplinary Core Idea. Multiple Scientific and Engineering Practices are represented across the performance expectations for a given Disciplinary Core Idea. Curriculum and assessment must be developed in a way that builds students' knowledge and ability toward the performance expectations. As the NGSS are performances meant to be accomplished at the conclusion of instruction, quality instruction will have students engage in several practices throughout instruction.

Because of the coherence of the NGSS, teachers have the flexibility to arrange the performance expectations in any order within a grade level to suit the needs of states or local districts. The use of various applications of science, such as medicine, forensics, agriculture, or engineering, would nicely facilitate student interest and demonstrate how scientific principles outlined in the *Framework* and NGSS are applied in real world situations.

Next Steps

With the final release of the NGSS in April 2013, states will begin their individual processes to consider adoption. The lead states are under no obligation to adopt, only to seriously consider adoption. There is no set timeline for adoption or implementation. As with all K-12 educational standards, the decision to adopt by any given state is voluntary.

## Appendix B—Science Teacher Leadership in OUSD: Roles, Responsibilities, & Benefits

# Science Teacher Leadership in OUSD
# 2016-2017 Roles, Responsibilities, & Benefits

## Description

Science Teacher Leaders continue to serve as lead learners in their content, playing a critical role in the development of site-based leadership to support the transition to the Next Generation Science Standards. Science Teacher Leaders collaborate to improve science instruction, advocate in the service of effective science instruction, model effective science practices, and provide resources. They exercise their influence in formal and informal contexts, maintain a growth mindset, and support Professional Learning Community structures within their schools.

For 2016-2017, the instructional focus will be based on the NGSS pedagogical shifts, with particular attention to writing with evidence, quality lesson design and inquiry, small group instruction, and academic social emotional learning. Leaders will use the Student Indicators of High Quality Science Learning to gauge student learning.

## Roles and Responsibilities

- Serve on the site Instructional Leadership Team (ILT), which meets a minimum of once a month.
- Support implementation and revision of the site plan with administration and ILT to improve instruction and student achievement.
- Work with ILT to facilitate site-based professional learning and site-based inquiry cycles. This can include department meetings, collaboration sessions, or lesson study focused on the implementation of NGSS.
- Serve as an advocate and point person for instructional shifts in science at school sites, and coordinate with other Teacher Leaders to support cross-content pedagogical shifts in the classroom.
- Support grade level teams of teachers as they engage in collaborative instructional planning cycles around the instructional shifts.
- Promote and foster a culture of collaboration and collective responsibility for teaching and learning.
- Open her/his classroom to colleagues and invite them to learn together. Model a disposition of continuous learning and reflection
- Communicate information shared and learned from Science TL meetings with school staff in a timely way.
- Use OUSD Google email/calendar/documents for communication.
- TK-5 Teacher Leaders also:
    - Coordinate the delivery and pickup of the FOSS kits
    - Submit inventory forms for missing materials at the start of each trimester
    - Order live organisms before the start of the life science rotation for the school

## Activities

- All K-12 Science Teacher Leaders attend 6 professional learning sessions, from 4:00-6:00 pm on:
    - August 18, 2016 at the Oakland Zoo
    - September 22, 2016 at Chabot Space and Science center
    - November 3, 2016 at Chabot Space and Science Center
    - January 5, 2017 at the Oakland Zoo
    - March 2, 2017 at the Oakland Zoo
    - May 4, 2017 at the Oakland Zoo
- TK-5 Science Teacher Leaders attend one Live Organism meeting during their school's FOSS Life Science rotation, from 4:30-6:00 pm at the SMART Center on:
    - August 25, 2016 (fall)

# Elementary Principal Science Professional Development

Components for Each Session

1 Building a collective identity in support of science education
2 Engage in a science activity as learners
3. Provide opportunities for reflection and application of content
4 Create a vision and plan for science education in Oakland
5. Build on existing individual and collective knowledge, and previous sessions

| Date* | | September 13 | October 11 | January 24 | February 21 or 28 | March 27 | May 22<br>June 19/20 |
|---|---|---|---|---|---|---|---|
| Themes | | Science as a Schoolwide Focus | Framework for Science Education | Science & Literacy | Communities of Science Learners | Science & Equity | A Schoolwide Science Program |
| Outcome | | Develop school science goals for 2011-12 | Understand and apply a science framework to the school plan | Identify and integrate strategies for literacy and science instruction | Use the community to improve science at each school | Address opportunities for equitable science participation and achievement | Create a vision and a plan for a schoolwide science program |
| Topics and Activities | Conditions | • Welcome and Introduction<br>• Framing the Series<br>• Addressing Concerns and Challenges | • Principal Panel (Schedules & Structures for Science) | • Teacher Panel (Science Instruction & Implementation) | • Site Visits by Regions<br>• Debrief on Site | • Starting Statements/Clickers<br>• High School Student Panel | • Invite Lead Science Teachers to Attend<br>• Building Teacher Leadership Capacity<br>• Reflections on the Past Year |
| | Culture | • Activity – Mixtures and Solution Investigation (Inquiry, Exploration)<br>• Reflection and Sharing on School Science Goals | • Activity - Marshmallow Challenge (Team Building, Engineering Design) | • Video Analysis of a Science Lesson<br>• Video of PLC – Teachers Talking About Science, Planning and Outcomes | • Parent & Community Involvement | • Small Group and Large Group Discussion of Site Based Challenges<br>• Courageous Conversations | • Activity – Magnet Investigation (The Role of The Teacher)<br>• Teacher Leadership<br>• Reading - *Science Education Leadership*<br>• Partner Schools |
| | Competency | • Science Inquiry<br>• District Science Overview<br>• Science Continuum and Framework for School Change | • National Science Framework and the Common Core<br>• K-5 Articulation | • Activity – Syringe Investigation (Role of Language, Notebooking)<br>• Academic Language and Literacy<br>• Observation Tools | • 5x8 card -observation tool<br>• Learning walks | • CST Analysis by Site and District<br>• *What is Equity in Science?* Reading/Jigsaw | • Revisiting The Science Continuum and Framework for School Change<br>• Planning for Next Year |
| Support Between Sessions | | • Introduce Specialist to Principals and LSTs<br>• Site-Based PD | • Site-Based PD<br>• Meeting in Regional Teams | • Classroom Observations<br>• Site-Based PD | • Site-Based PD | • Site-Based PD | • Site-Based PD |
| Schools Resources | | Field Trips<br>Weekend Walkabout<br>DonorsChoose<br>Outdoor Education | Community Resources for Science | Science Fair | Volunteers<br>Family Science Night<br>Science Horizons<br>Faith Network | Dinner With A Scientist | Summer Opportunities for Teachers |

* Updated February 17, 2012

**Appendix D—Science 5x8 Card**

## Practices for High Quality K-12 Science Education

The Next Generation Science Standards (NGSS) define eight scientific and engineering practices for students as they engage in science learning. Not all practices will be evident every time, in every activity. Evidence of the practices exists through student activities and interactions. See reverse for student behaviors.

### Scientific and Engineering Practices

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (2011). National Research Council
http://www7.nationalacademies.org/bose/Standards_Framework_Homepage.html

## K-12 Science Learning Principles and Actions

| Principles (Practices) | Vital Student Actions |
|---|---|
| 1. Questions guide inquiry *(1, 4, 8)* | Students **ask** meaningful **questions** relevant to the science topic or lesson. |
| 2. Learning occurs through investigations *(1, 2, 3, 4, 5)* | Students use materials, tools, and texts to **explore**, **gather data**, and **answer questions**. |
| 3. Explanations are evidence-based *(2, 4, 5, 6, 7, 8)* | Students use evidence to **interpret** observations, **support** ideas, and **construct** explanations. |
| 4. Science is a community endeavor that evolves with new evidence *(4, 5, 6, 7, 8)* | Students **collaborate** to build understanding and **revise** their thinking when presented with new evidence. |
| 5. Application is essential for building understanding *(1, 2, 3, 6)* | Students **apply** science knowledge *and* practices to respond to open-ended and novel problems. |
| 6. Academic success depends on academic language | Students use discipline-specific **academic language**, **models** and **mathematics** to communicate understanding **orally** and in **writing**. |
| 7. ELs develop language through content | English learners produce language that **communicates** ideas and reasoning, even when that language is imperfect. |
| 8. Equitable participation | All students are **engaged** in learning and **choose** appropriate **scaffolds** for learning. |

Oakland Unified School District, Science Department — Version 2.4 - November 25, 2012

**Appendix G—Excerpt from *NGSS Transitional Standards & Leadership Toolkit***

OUSD Science

## OUSD NGSS Transition Guide for Elementary Schools: The SIRA

The Science Instructional Reflection and Assessment (SIRA) was designed as a transition strategy to prepare OUSD K-5 elementary teachers and students for the exciting shifts of the newly adopted Next Generation Science Standards (NGSS). Developed by OUSD's Elementary Science Team in partnership with veteran OUSD teachers, the SIRA is an instructional sequence that helps focus and deepen the teaching of FOSS science modules, while emphasizing the science practices and crosscutting concepts called for in NGSS. The SIRA is anchored by clear learning goals, encourages frequent formative assessment, and leads to a succinct summative assessment for FOSS science modules in grades 3-5. The SIRA is to be used hand-in-hand with our current FOSS modules. The K-2 version of the SIRA is called SIRA Elements, since it is slightly more concise and does not contain a summative assessment.

### Why the SIRA?

The Elementary Science Team is driven by a vision that all Oakland students enter middle school with a solid understanding of key scientific principles and practices. This is a minimum requirement for participating in a democratic society, where science plays an important role around issues of health, safety, and well-being. Further, we strive to ensure that all Oakland students, regardless of race/ethnicity, socio-economic status, or language learner status, gain access to and succeed in the highest levels of high school science offered here in OUSD, the Advanced Placement (AP) courses. Currently, a disproportionately low number of African American and Latino students enroll in these classes, and even fewer receive passing grades on the end-of-year AP exams. This reality is unacceptable, given that it maintains a status quo where the vast majority of science-based career opportunities remain out of reach for many of our youth. We see this as a social justice issue and one that we have the capacity, as educators working collaboratively, to address right now.

To that end, the SIRA was designed to support teachers in understanding their NGSS-aligned learning goals more deeply so that they may ensure that students are meeting those goals and will succeed in classrooms, college, and career. Furthermore, the SIRA expands opportunities for language and literacy development through the rich context of science, thereby reflecting the goals of the CA-ELD Standards, CCSS-ELA, and NGSS.

### What is the SIRA?

*Conceptual Framework*. The SIRA begins with a conceptual framework that tightly outlines the most important science concepts, Science Practices, and Crosscutting Concepts addressed in a particular FOSS module. This map serves as the anchor for

subsequent sections of the SIRA. The science concepts (Big Idea and Supporting Concepts) in the SIRA Conceptual Framework are derived from the 1998 CA Science Standards and informed by the Disciplinary Core Ideas of the NGSS. The Disciplinary Core Ideas may appear in a different grade level SIRA Conceptual Framework than in the NGSS, since the FOSS kits that teachers have in their classrooms are based on the 1998 CA Standards. To use the Disciplinary Core Ideas from NGSS would require grade levels to obtain new materials. Until we adopt new NGSS-aligned curriculum, we will use our current FOSS kits, teach the content from those kits, and add the NGSS Science Practices and Crosscutting Concepts through the SIRA.

*Instructional Plan and Formative Assessment.* With the conceptual framework as an anchor, a highly focused, lesson-by-lesson instructional roadmap was designed that outlines tightly connected focus questions, key concepts, and learning objectives. Suggestions for assessing each objective through writing or discussion prompts are offered, including optional scaffolds and expected student responses. The most commonly suggested forms of formative assessment are the 10-minute *Reflective Assessment Protocol* for written work, a Science Talk with class checklist for oral assessment, and an Observation Grid for use in K-2 SIRA Elements.

*Summative Assessment.* In grades 3-5, the instructional plan culminates in a single, short (7-10 question) written assessment designed from a pool of existing FOSS assessment items as well as some that were internally-developed. The assessment covers science ideas from FOSS as well as crosscutting concepts and practices from NGSS, with a focus on higher-order thinking skills and evidence-based reasoning as emphasized in the Common Core. Assessment items are mostly short-answer, with occasional multiple choice items. Students are permitted to consult their Science Notebooks during the assessment. Teachers administer the assessment in a single 45-minute period, and teachers individually score them.

The formative and summative assessments may be used immediately by teachers as a classroom learning tool to assess student progress toward mastery of science concepts and practices. Ideally, summative results will show high levels of student understanding due to more consistent formative assessment integrated throughout the module. Completed summative assessments and scores will be collected through Illuminate and the Elementary Science Team will use these to further refine assessment items and improve the assessment's reliability.

Through the SIRA, students will have the opportunity to experience NGSS-aligned science and should be prepared for the new state assessment in science, the California Science Test (CAST).

Exhibit B

# Oakland Unified School District Purchase Commitment

| | | | | | |
|---|---|---|---|---|---|
| Complete Kits | $1,127,623.24 | | | | |
| Teacher Materials | $ 291,744.85 | | | | |
| Professional Development | $ - | | | | |
| Refill Kits | $ - | | | | |
| Reading Components | $ 87,884.30 | | | | |
| Living Materials | $ - | | | | |
| Conversion / Upgrade Kits | $ - | | Subtotal | $ | 1,507,252.39 |
| Miscellaneous | $ - | 3%3 | Shipping & Handling | $ | 45,217.57 |
| Online | $ - | | Living Material Shipping | $ | - |
| Subtotal | $1,507,252.39 | 8.0% | *Est. Sales Tax | $ | 120,580.19 |
| | | | Total* | $ | 1,673,050.15 |

**Customer Savings:**

****Discounts are based on the order AS IS****

* Please add sales tax where applicable. Exempt residents please provide Tax Exemption Certificate.

| | | |
|---|---|---|
| Reduced Shipping & Handling | = | $135,652.72 |
| Discounted / Bonused Materials | = | $938,045.95 |
| Total Savings: | | $1,073,698.67 |

| Part Number | Item Description | Type | Unit Price | Qty | Extended Price | Comments | |
|---|---|---|---|---|---|---|---|
| | **Kindergarten** | | | | | | |
| 1487647 | KIT FOSS ANIMALS 2X2 NEXT GEN | Kit | $ 879.00 | 70 | $ 49,224.00 | BONUS 14 | 978-1-62571-415-2 |
| 1487626 | SCI RES BK FOSS ANIMALS 2X2 NG 8PK | Reading | $ 49.95 | 332 | $ - | BONUS | 978-1-62571-419-0 |
| 1487635 | SCI RES BBK FOSS ANIMALS 2X2 NEXT GEN | Reading | $ 34.95 | 83 | $ - | BONUS | 978-1-62571-421-3 |
| 1487669 | TEA TOOLKIT FOSS ANIMALS 2X2 NEXT GEN | TM | $ 225.95 | 83 | $ 18,753.85 | | 978-1-62571-416-9 |
| 1524339 | ONLINE FOSS NG ANMLS 2X2 PRM ACC 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | |
| 1487649 | KIT FOSS TREES+WEATHER NEXT GEN | Kit | $ 1,029.00 | 70 | $ 57,624.00 | BONUS 14 | 978-1-62571-429-9 |
| 1487628 | SCI RES BK FOSS TREES+WEATHER NG 8PK | Reading | $ 49.95 | 332 | $ - | BONUS | 978-1-62571-433-6 |
| 1487637 | SCI RES BBK FOSS TREES+WEATHER NG | Reading | $ 34.95 | 83 | $ - | BONUS | 978-1-62571-435-0 |
| 1487671 | TEA TOOLKIT FOSS TREES+WEATHER NG | TM | $ 225.95 | 83 | $ 18,753.85 | | 978-1-62571-430-5 |
| 1524349 | ONLINE FOSS NG TRESS+WTHER PRM ACC 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-502-9 |
| 1487648 | KIT FOSS MATERIALS+MOTION NG | Kit | $ 964.00 | 70 | $ 53,984.00 | BONUS 14 | 978-1-62571-422-0 |
| 1487627 | SCI RES BK FOSS MATERIALS+MOTION NG 8PK | Reading | $ 49.95 | 332 | $ - | BONUS | 978-1-62571-426-8 |
| 1487636 | SCI RES BBK FOSS MATERIALS+MOTION NG | Reading | $ 34.95 | 83 | $ - | BONUS | 978-1-62571-428-2 |
| 1487670 | TEA TOOLKIT FOSS MATERIALS+MOTION NG | TM | $ 225.95 | 83 | $ 18,753.85 | | 978-1-62571-423-7 |
| 1524340 | ONLINE FOSS NG MAT+MOTION PRM ACC 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-501-2 |
| | **First Grade** | | | | | | |
| 1487652 | KIT FOSS PLANTS + ANIMALS NEXT GEN | Kit | $ 919.00 | 70 | $ 51,464.00 | BONUS 14 | 978-1-62571-279-0 |
| 1487631 | SCI RES BK FOSS PLNTS+ANIMLS NX GN 8PK | Reading | $ 49.95 | 312 | $ - | | 978-1-62571-283-7 |
| 1487640 | SCI RES BBK FOSS PLNTS+ANMALS NEXT GEN | Reading | $ 34.95 | 78 | $ 2,726.10 | | 978-1-62571-285-1 |
| 1487674 | TEA TOOLKIT FOSS PLNTS+ANIMLS NXT GN | TM | $ 225.95 | 78 | $ 17,624.10 | | 978-1-62571-280-6 |
| 1511915 | ONLINE FOSS PLT+ANIM NX GN PREM PK 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-653-8 |
| 1487650 | KIT FOSS AIR+WEATHER NEXT GEN | Kit | $ 889.00 | 70 | $ 49,784.00 | BONUS 14 | 978-1-62571-436-7 |
| 1487629 | SCI RES BK FOSS AIR+WTHER NXT GEN 8PK | Reading | $ 49.95 | 312 | $ - | | 978-1-62571-440-4 |
| 1487638 | SCI RES BBK FOSS AIR + WEATHER NEXT GN | Reading | $ 34.95 | 78 | $ 2,726.10 | | 978-1-62571-442-8 |
| 1487672 | TEA TOOLKIT FOSS AIR+WEATHER NEXT GEN | TM | $ 225.95 | 78 | $ 17,624.10 | | 978-1-62571-437-4 |
| 1511914 | ONLINE FOSS AIR+WTH NXT GN PREM PK 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-652-1 |
| 1487651 | KIT FOSS SOUND+LIGHT NEXT GEN | Kit | $ 1,069.00 | 70 | $ 59,864.00 | BONUS 14 | 978-1-62571-272-1 |
| 1487630 | SCI RES BK FOSS SOUND+LIGHT NXT GN 8PK | Reading | $ 49.95 | 312 | $ - | BONUS | 978-1-62571-276-9 |
| 1487639 | SCI RES BBK FOSS SOUND+LIGHT NEXT GEN | Reading | $ 34.95 | 78 | $ 2,726.10 | | 978-1-62571-278-3 |
| 1487673 | TEA TOOLKIT FOSS SOUND+LIGHT NEXT GN | TM | $ 225.95 | 78 | $ 17,624.10 | | 978-1-62571-273-8 |
| 1511913 | ONLINE FOSS SND+LGT NXT GN PREM PK 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-651-4 |
| | **Second Grade** | | | | | | |
| 1487653 | KIT FOSS INSECTS + PLANTS NEXT GEN | Kit | $ 969.00 | 70 | $ 54,264.00 | BONUS 14 | 978-1-62571-286-8 |
| 1487632 | SCI RES BK FOSS INST+PLNT NXT GN 8PK | Reading | $ 49.95 | 320 | $ - | BONUS | 978-1-62571-290-5 |
| 1487641 | SCI RES BBK FOSS INSCTS+ PLNTS NEXT GEN | Reading | $ 34.95 | 80 | $ 2,796.00 | | 978-1-62571-292-9 |
| 1487675 | TEA TOOLKIT FOSS INSCTS+PLNTS NEXT GN | TM | $ 225.95 | 80 | $ 18,076.00 | | 978-1-62571-287-5 |
| 1504993 | ONLINE FOSS NXT GN INS+PLNT PRM ACC 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-407-7 |
| 1509827 | KIT FOSS PEBS, SAND, AND SILT NEXT GEN | Kit | $ 1,034.00 | 70 | $ 57,904.00 | BONUS 14 | 978-1-62571-293-6 |
| 1487633 | SCI RES BK FOSS PBLS SND+SILT NX GN 8PK | Reading | $ 49.95 | 320 | $ - | BONUS | 978-1-62571-297-4 |
| 1487642 | SCI RES BBK FOSS PBLS SND+SILT NEXT GEN | Reading | $ 34.95 | 80 | $ 2,796.00 | | 978-1-62571-299-8 |
| 1487676 | TEA TOOLKIT FOSS PBLS SND+SILT NEXT GN | TM | $ 225.95 | 80 | $ 18,076.00 | | 978-1-62571-294-3 |
| 1504989 | ONLINE FOSS NXT GN PB SND SLT PRM ACC 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-406-0 |
| 1487655 | KIT FOSS SOLIDS + LIQUIDS NEXT GEN | Kit | $ 1,179.00 | 70 | $ 66,024.00 | BONUS 14 | 978-1-62571-300-1 |
| 1487634 | SCI RES BK FOSS SOL+LIQ NEXT GEN 8PK | Reading | $ 49.95 | 320 | $ - | BONUS | 978-1-62571-304-9 |
| 1487643 | SCI RES BBK FOSS SOL+LIQUIDS NEXT GEN | Reading | $ 34.95 | 80 | $ 2,796.00 | | 978-1-62571-306-3 |
| 1487677 | TEA TOOLKIT FOSS SOL+LIQ NEXT GEN | TM | $ 225.95 | 80 | $ 18,076.00 | | 978-1-62571-301-8 |
| 1504982 | ONLINE FOSS NXT GN SOL+LIQ PRM ACC 1 CLS | Online | $ 159.00 | 70 | $ - | BONUS | 978-1-62571-405-3 |
| | **Third Grade** | | | | | | |
| 1487658 | KIT FOSS STRUCTURES OF LIFE NEXT GEN | Kit | $ 1,204.00 | 70 | $ 67,424.00 | BONUS 14 | 978-1-62571-313-1 |
| 1487614 | SCI RES BK FOSS STRCTR OF LIFE NGSS P/16 | Reading | $ 169.00 | 152 | $ - | | 978-1-62571-317-9 |
| 1487679 | TEA TOOLKIT FOSS STRCTRS OF LIFE NEXT GEN | TM | $ 233.00 | 76 | $ 17,708.00 | | 978-1-62571-314-8 |
| 1491619 | ONLINE FOSS NXT GN STRUC OF LIFE PRM ACC 1 | Online | $ 179.00 | 70 | $ - | BONUS | 978-1-62571-396-4 |
| 1487659 | KIT FOSS WATER + CLIMATE NEXT GEN | Kit | $ 1,219.00 | 70 | $ 68,264.00 | BONUS 14 | 978-1-62571-319-3 |
| 1487615 | SRB FOSS WATER + CLIMATE NEXT GEN 16PK | Reading | $ 169.00 | 152 | $ - | BONUS | 978-1-62571-323-0 |
| 1568281 | KIT FOSS ADD SESSION WATER + CLIMATE NG | Kit | $ 253.99 | 76 | $ 19,303.24 | | |
| 1491621 | ONLINE FOSS NXT GN WATER+CLIMATE PRM ACC | Online | $ 179.00 | 70 | $ - | BONUS | 978-1-62571-397-1 |
| 1487657 | KIT FOSS MOTION + MATTER NEXT GEN | Kit | $ 1,174.00 | 70 | $ 65,744.00 | BONUS 14 | 978-1-62571-307-0 |
| 1487613 | SRB FOSS MOTION+ MATTER NEXT GEN PK/16 | Reading | $ 169.00 | 152 | $ 25,688.00 | | 978-1-62571-311-7 |
| 1487678 | TEA TOOLKIT FOSS MOTION + MATTER NEXT GEN | TM | $ 233.00 | 76 | $ 17,708.00 | | 978-1-62571-308-7 |
| 1491622 | ONLINE FOSS NXT GN MOTION+MTTR PRM ACC 1 C | Online | $ 179.00 | 70 | $ - | BONUS | 978-1-62571-398-8 |
| | **Fourth Grade** | | | | | | |
| 1487661 | KIT FOSS ENVIRONMENTS NEXT GEN | Kit | $ 1,319.00 | 60 | $ 63,312.00 | BONUS 12 | 978-1-62571-331-5 |
| 1487617 | SCI RES BK FOSS ENVIRONMENTS NG 16PK | Reading | $ 169.00 | 131 | $ - | BONUS | 978-1-62571-335-3 |
| 1487682 | TEA TOOLKIT FOSS ENVIRONMENTS NG | TM | $ 233.00 | 66 | $ 15,378.00 | | 978-1-62571-332-2 |
| 1514676 | ONLINE FOSS NG ENVRONMENTS PRM ACC 1 CLS | Online | $ 179.00 | 60 | $ - | BONUS | 978-1-62571-479-4 |
| 1487664 | KIT FOSS SOILS ROCKS+LANDFORMS NEXT GEN | Kit | $ 1,339.00 | 60 | $ 64,272.00 | BONUS 12 | 978-1-62571-343-8 |
| 1487619 | SCI RES BK FOSS SOLS RCKS+LNFRMS NG 16PK | Reading | $ 169.00 | 131 | $ - | BONUS | 978-1-62571-347-6 |
| 1487684 | TEA TOOLKIT FOSS SOILS RCKS+LNDFRMS NG | TM | $ 233.00 | 66 | $ 15,378.00 | | 978-1-62571-344-5 |
| 1514677 | ONLINE FOSS NG SOILS RKS+LNFRS PRM ACC 1 C | Online | $ 179.00 | 60 | $ - | BONUS | 978-1-62571-480-0 |
| 1487660 | KIT FOSS ENERGY NEXT GENERATION | Kit | $ 1,689.00 | 60 | $ 81,072.00 | BONUS 12 | 978-1-62571-325-4 |
| 1487616 | SCI RES BK FOSS ENERGY NEXT GEN 16PK | Reading | $ 169.00 | 131 | $ - | BONUS | 978-1-62571-329-2 |
| 1487681 | TEA TOOLKIT FOSS ENERGY NEXT GEN | TM | $ 233.00 | 66 | $ 15,378.00 | | 978-1-62571-326-1 |
| 1514675 | ONLINE FOSS NXT GN ENERGY PRM ACC 1 CLS | Online | $ 179.00 | 60 | $ - | BONUS | 978-1-62571-478-7 |
| | **Fifth Grade** | | | | | | |
| 1487665 | KIT FOSS LIVING SYSTEMS NEXT GEN | Kit | $ 1,314.00 | 60 | $ 63,072.00 | BONUS 12 | 978-1-62571-349-0 |
| 1487620 | SCI RES BK FOSS LIVING SYSTEMS NG 16PK | Reading | $ 169.00 | 135 | $ - | BONUS | 978-1-62571-353-7 |
| 1487685 | TEA TOOLKIT FOSS LIVING SYSTEMS NG | TM | $ 233.00 | 67 | $ 15,611.00 | | 978-1-62571-350-6 |
| 1524500 | ONLINE FOSS NG LVNG SYSTMS PRM ACC 1 CLS | Online | $ 179.00 | 60 | $ - | BONUS | 978-1-62571-503-6 |
| 1530365 | KIT FOSS EARTH AND SUN NEXT GEN | Kit | $ 1,389.00 | 60 | $ 66,672.00 | BONUS 12 | 978-1-62571-367-4 |
| 1487624 | SCI RES BK FOSS EARTH AND SUN NG 16PK | Reading | $ 169.00 | 135 | $ 22,815.00 | | 978-1-62571-371-1 |
| 1487689 | TEA TOOLKIT FOSS EARTH AND SUN NG | TM | $ 233.00 | 67 | $ 15,611.00 | | 978-1-62571-368-1 |
| 1524502 | ONLINE FOSS NG EARTH+SUN PRM ACC 1 CLS | Online | $ 179.00 | 60 | $ - | BONUS | 978-1-62571-505-0 |
| 1487666 | KIT FOSS MIXTURES+SOLUTIONS NEXT GEN | Kit | $ 1,424.00 | 60 | $ 68,352.00 | BONUS 12 | 978-1-62571-355-1 |
| 1487621 | SCI RES BK FOSS MIX+SOLUTIONS NG 16PK | Reading | $ 169.00 | 135 | $ 22,815.00 | | 978-1-62571-359-9 |
| 1487687 | TEA TOOLKIT FOSS MIXTURES+SOLUTIONS NG | TM | $ 233.00 | 67 | $ 15,611.00 | | 978-1-62571-356-8 |
| 1524501 | ONLINE FOSS NG MIX+SOL PRM ACC 1 CLS | Online | $ 179.00 | 60 | $ - | BONUS | 978-1-62571-504-3 |

1. The terms of the Agreement are hereby incorporated into this Order.

2. The Product shall be delivered to following location(s):
    i. All FOSS kits/ modules are to be delivered to the Oakland Unified School District warehouse; and
    ii. All print materials are to be delivered directly to the school sites. The district will provide details such as specific addresses prior to the shipment.

3. The dates of delivery of the Products and Deliverables shall be as follows:
    i. All FOSS kits/modules by October 19, 2018; and
    ii. All print materials by November 2, 2018.

4. The payment terms due to the Contractor from the District for the Product and Deliverables as above described shall be as set forth in Article 7 of the Agreement, as amended.