

# K-5 Science Curriculum Review Committee

Recommendation to the IMC

April 25, 2017





# Members of the committee

- Kristen Wren, 4<sup>th</sup> grade, Livingston
- Rebecca Oxford, 5<sup>th</sup> grade, Marie Curie STEM
- Hattie Osborne, Kindergarten, Franklin STEM
- Beth Austin, 4<sup>th</sup> grade, Livingston
- Kara Kaelber, Community Partner and Parent
- Beth Gonzalez, 5<sup>th</sup> grade, McClintock STEM
- Mary LeCompte, 5<sup>th</sup> grade, McClintock STEM



# Process for Selection

- Established a pre-screener
- Reviewed current materials
- Surveyed parents and teachers and summarized results
- Requested materials from various vendors
- Reviewed materials with pre-screener
- Requested vendor presentations
- Completed vendor matrix and narrowed materials
- Designed rollout plan for materials
- Make recommendation

## Pre-Screening Rubric

Title: Science Materials		Publisher: Copyright:		Grade Levels: Elementary	
Our Values		Y/N/S	Criteria We Must Include		Y/N/S
Allows for Rigor and Remediation			<del>Must include Technology</del> Components that addresses the development of 21 <sup>st</sup> Century Skills.		
Worldwide connections and local connections			Professional Development		
Language is accessible for all learners (ELL, SPED, Advanced), and language of instruction (Spanish and English and/or translation rights).			<del>Must include</del> Support materials that address all language levels		
Technology Component that addresses the development of 21 <sup>st</sup> Century Skills			Sustainability of the consumable resources/materials		
NGSS / 3-D (DCI, SEP, CC) Instruction and Assessment Aligned, including Performance Tasks			NGSS / 3-D (DCI, SEP, CC) Instruction and Assessment Aligned, including Performance Tasks		
Implementable (doable) hands on inquiry based STEM/simulation centered on student learning			Differentiated learning materials and styles to address <del>DOK</del> -Blooms Taxonomy		
Developmentally and Age appropriate					
<b>Y = Yes N=No S=Somewhat</b>					



# SUMMARY OF PARENT SURVEYS:

1. The three most important aspects of quality science curriculums are:
  - Scientifically accurate
  - Hands-on/inquiry-based instruction
  - Age and developmentally appropriate materials
2. Equal access to a STEM education for all Pasco elementary students
3. The student experience to be engaging, hands-on, and applicable to the real-world
4. Students to investigate the “how” and “why” and be able to think critically about the world around them
5. Trained teachers who draw on local experts/scientists and real-life application



# SUMMARY OF TEACHER SURVEYS:

1. According to the majority of surveyed elementary teachers, the three most important aspects of quality science curriculums are:
  - NGSS alignment
  - Hands-on/inquiry-based instruction
  - Age and developmentally appropriate materials
2. In the use of science instructional materials, 98% of teachers named professional development and 93% stated sustainability of consumables and materials as important or very important.
3. 73% of teachers surveyed identified needing some level of NGSS training with about 20% of respondents having received no training at all.
4. Many teachers emphasized the need for equity at all schools in order to have access to all instructional materials.



# Process for Selection

Elementary Science Committee  
Vendor Presentation Comparison Matrix

	Professional Development: how	21st Century Skills	Spanish	NGSS - 3D	Sustainability of consumables	Differentiated learning materials	Assesment	Hands-On
<b>Inspire Science (McGraw Hill)</b> Available NOW	"We adopt you!" Initial is face-to-face, followed up with webinars, digital training available all the time.	Career Kids, simulations, videos games, videos	Print available in Spanish, teacher stuff only in English, videos/simulations only English, leveled readers in Spanish. We would be able to translate to	PE's were connected to 3D, very scripted, weak shift in the 5E	Flexible modular design. 6-7 modules per grade, 2-7 lessons per module. Print, digital and physical materials available. They will refill kits.	leveled readers, limited teacher recommendations	Many of the PT's and experiments were very guided with no inquiry. End of unit assessment was multiple choice/online.	Approximately 1-2 hands-on per week
<b>Smithsonian (STC)</b> Kinder available now, Engineering available for all grades next year, 2018-2019 roll-out for the rest	Free online videos, resources, discussion prompts for PLCs. Train-the-trainer models (with trainer guides), publisher provided PD. Part of LASER Alliance.	Use actual science tools, adding simulations, life and career skills (role cards & collaboration), very real world and purposeful	Spanish glossary, teacher guides are NOT in Spanish. LASER translates worksheets and printables. Readers not in Spanish.	Driving questions for each module, true verticle progression, every single lesson has a 3D moment. Integrated bundles (naturally connecting content standards).	LASER Alliance, BSRC	Remidiation available after assessment, ELA/math connections and support, identified misconceptions, questioning strategies/call out boxes, ELL support.	pre-assessments (K'w), culminating design challenge, formative, notebook, presentations, models, self-assessments and written assessments	Approximately 3 or more hands-on per week
<b>Building Blocks of Science (Available NOW)</b>	In person and web-based	Website, some simulations available, Tig Tag videos (videos translated).	Spanish components, teacher and student	New program, acting as a scientist, using essential questions	Kindergarten refurbishment through BSRC, other grades - district responsibility	Literacy readers, some enrichment (but not detailed (vague)	Performance-based tasks, on-line tasks, paper/pencil, notebook, observational (vague)	Approximately 3 or more hands-on per week
<b>STEMScopes</b> Available NOW	Imbedded, On-demand videos on-line as you teach each lesson (STEM coach), set up video in the outline	Digital subscription, on-line video, readings, simulations, and student response options, review games/videos, home connections, parent accessible	K-8, teacher and student, videos/games are not in Spanish	Built for NGSS, 3-D represented, constructivist approach, 5E format	Annual renewable available, student notebook if you choose as well	Acceleration and intervention provided, varied lexile levels, ELL supports. Modules are have flexible pacing/delivery schedule. They can be done in any order.	Different levels/versions of assessments. Four types of evaluations (claims & evidence, open-ended response, multiple choice, performance task). Performance task is 3-D. Online and PDF printable.	Approximately 2-5 hands-on in the Explore stage
<b>HMH Fall 2017</b>	Implementation, NGSS/Pedagogy/Management, coaching, AskHMH by phone. In person and web-based.	Interactive lessons and/or digital lessons. GOOGLE Expeditions (virtual field trip on virtual reality goggles in each unit). "Think Central" response online.	Spanish available in most student materials. Rights to translate in Russian.	PE's were connected to 3D, very scripted, weak shift in the 5E	Refurbishment of materials and consumables available	Expected misconception call outs in teacher manual differentiation weak.	Formative, end of unit, self-assessment, performance task. ExamView	Approximately one hands-on for five days (1 per lesson)



# Smithsonian (LASER)

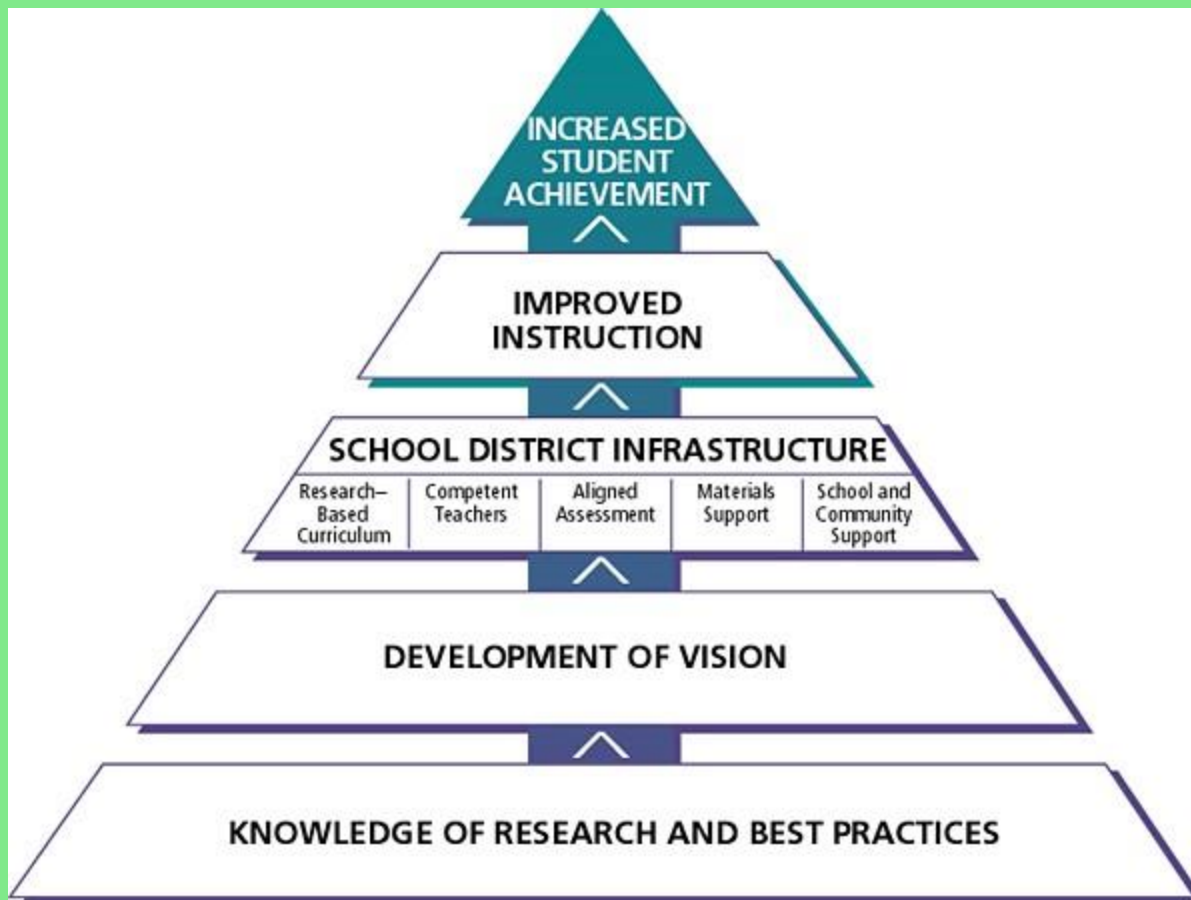
The Leadership and Assistance for Science Education Reform (LASER) Model is at the core of all of the Smithsonian Science Education Center's work and requires five elements:

- research-based, inquiry-driven curriculum
- professional development
- materials support
- administrative and community support
- appropriate assessment





# The LASER Model





# Additional Reasons for Selection

- Kits developed with bundled Next Generation Science Standards and three-dimensional learning
- STEM, real-world, and problem-based
- Student-driven inquiry with frequent hands-on experiences
- On-going professional development with grade specific support
- Sustainability and storage of consumables



# Building Blocks of Science(BBS)

- Building Blocks of Science meets the needs of Kindergarten students:
  - Rigorous
  - Developmentally appropriate
  - Inquiry and problem-based
  - Hands-on
- Supported by LASER for professional development and consumables



# Scored materials using the EQuIP Rubric



## EQuIP Rubric for Lessons & Units: Science

Reviewer Name or ID:

Grade:

Lesson/Unit Title:

### I. Alignment to the NGSS

The lesson or unit aligns with the conceptual shifts of the NGSS:

Criteria	Specific evidence from materials and reviewers' reasoning	Suggestions for improvement
<input type="checkbox"/> A. Grade-appropriate elements of the science and engineering practice(s), disciplinary core idea(s), and crosscutting concept(s), work together to support students in three-dimensional learning to make sense of phenomena and/or to design solutions to problems. <ul style="list-style-type: none"> <li>i. Provides opportunities to develop and use specific elements of the practice(s) to make sense of phenomena and/or to design solutions to problems.</li> <li>ii. Provides opportunities to develop and use specific elements of the disciplinary core idea(s) to make sense of phenomena and/or to design solutions to problems.</li> <li>iii. Provides opportunities to develop and use specific elements of the crosscutting concept(s) to make sense of phenomena and/or to design solutions to problems.</li> <li>iv. The three dimensions work together to support students to make sense of phenomena and/or to design solutions to problems.</li> </ul>		

A unit or longer lesson will also:

Criteria	Specific evidence from materials and reviewers' reasoning	Suggestions for improvement
<input type="checkbox"/> B. Lessons fit together coherently targeting a set of performance expectations. <ul style="list-style-type: none"> <li>i. Each lesson links to previous lessons and provides a need to engage in the current lesson.</li> <li>ii. The lessons help students develop proficiency on a targeted set of performance expectations.</li> </ul>		
<input type="checkbox"/> C. Where appropriate, disciplinary core ideas from different disciplines are used together to explain phenomena.		
<input type="checkbox"/> D. Where appropriate, crosscutting concepts are used in the explanation of phenomena from a variety of disciplines.		
<input type="checkbox"/> E. Provides grade-appropriate connection(s) to the Common Core State Standards in Mathematics and/or English Language Arts & Literacy in History/Social Studies, Science and Technical Subjects.		

*If the lesson or unit is not closely aligned to the Next Generation Science Standards, it may not be appropriate to move on to the second and third categories. Professional judgment should be used when weighing the individual criterion. For example, a lesson without crosscutting concepts explicitly called out may be easier to revise than one without appropriate disciplinary core ideas; such a difference may determine whether reviewers believe the lesson merits continued evaluation or not.*



# Smithsonian and BBS Selected

- Philosophically and instructionally aligned to our district's research-based best practices and inquiry science
- Meets the needs expressed by teachers and parents
- Most teacher-friendly professional development, on-going support, and sustainability
- Aligned with Next Generation Science Standards
- Problem-based learning and real-world application
- Rigorous questioning strategies and high-cognitive demand activities were prevalent
- Opportunities for differentiation



# Reasons for Disqualifying Other Programs

- Lack of hands-on and student focused inquiry
- Technology needs
- Developmentally inappropriate
- Lack of rigor
- Not real-world or problem-based
- Missing components of the Next Generations Science Standards
- Unreasonable storage requirements
- Uncertainty of material sustainability
- Limited on-going professional development



# Bias Screener Results

Materials for BBS and Smithsonian passed the bias screener in all areas including gender, sexual orientations, race, socio-economic status, religion and culture.



# Rollout Plan



Smithsonian

**SCIENCE**

*for the classroom*

Life Science

Earth and Space Science

Physical Science

Engineering Design

## Grade 2

**How Do Plants and Animals Need Each Other?**

2-LS2-1 • 2-LS4-1 • 2-LS2-2 • K-2-ETS1-1

2021-2022

Supporting: Engineering Design

**What Can Maps Tell Us About Water on Earth?**

2-ESS2-2 • 2-ESS2-3 • 2-PS1-1

2019-2020

Supporting: Physical Science

**How Do Heating and Cooling Change Things?**

2-PS1-1 • 2-PS1-2 • 2-PS1-3 • 2-PS1-4 • K-2-ETS1-1

2020-2021

Supporting: Engineering Design

**How Can We Stop Soil From Washing Away?**

K-2-ETS1-1 • K-2-ETS1-2 • K-2-ETS1-3 • 2-ESS2-1 • 2-ESS1-1

Winter 2017-2018

Supporting: Earth and Space Science

Professional Development for the new kit will occur 1<sup>st</sup> Trimester. Kit will be delivered to buildings 2<sup>nd</sup> Trimester. More details to come!

Year	17-18				18-19				19-20				20-21				21-22			
	Kit 1	Kit 2	Kit 3	Kit 4	Kit 1	Kit 2	Kit 3	Kit 4	Kit 1	Kit 2	Kit 3	Kit 4	Kit 1	Kit 2	Kit 3	Kit 4	Kit 1	Kit 2	Kit 3	Kit 4
	Butterflies	Erosion*	Changes	N/A	Butterflies	Erosion	Changes	N/A	Butterflies	Erosion	Landforms*	Changes	Butterflies	Erosion	Landforms	P & C*	Erosion	Landforms	P & C	PAD *

NGSS bundles- Created for Butterflies and Changes. PD will be available for those bundles. Design challenges will also be added to the Changes kit.





# Next Steps

- Share implementation plan with staff
- Plan ongoing professional development
- Review LASER contract annually
- Repeat curriculum review with Salmon in the Classroom materials.
  - Designate a stipend for a districtwide 4<sup>th</sup> grade Salmon in the Classroom program
- Purchase STEMScopes as a supplemental material
  - Plan professional development
  - Identify units per grade level to supplement LASER rollout



# Recommendation

- *The Science Curriculum Review Committee is seeking a motion to recommend the adoption of the Smithsonian created Science for the Classroom kits for grades first through fifth and Building Blocks of Science for Kindergarten to the Pasco School Board.*



QUESTIONS?