# K-5 Science Materials Adoption

SCHOOL BOARD MEETING MAY 6, 2019



#### K-5 Science Adoption: Overview

- Review of the Science Adoption Process
- Key elements of recommended curriculum
  - Next Generation Science Standards (NGSS) Alignment
  - Effective Science Instructional Practices
  - Organization and Design
- Next Steps
- Board Questions



## Our Mission and Vision

#### Mission

 Each student will graduate prepared to lead a rewarding, responsible life as a contributing member of our community and greater society

#### Vision

- Every Student Future Ready:
  - Prepared for College
  - Prepared for the Global Workplace
  - Prepared for Personal Success

#### **Guiding Principles**

#### Connection

- Interconnected
   Learning Experiences
- Personalization & Individual Attention

#### Value

- Student Ownership
   & Engagement
- Equity & Cultural Responsiveness

#### Challenge

- Challenging & Meaningful Curriculum
- High Expectations & Quality Instruction

#### Strategic Goals



Use resources effectively & be fiscally responsible

**Engage our communities** 

#### Purpose

Each student will graduate prepared to lead a rewarding and responsible life as a contributing member of our community and greater society... through science instruction that is:

- Rigorous and relevant
- Innovative and individualized
- Equitable and exceptional



# Next Generation Science Standards

- A Framework for K-12 Science Education
  - National Academies Press (NAP) 2012
  - Research-based
  - "The Vision"
- Standards Developed
  - Based on the Framework
  - Managed by Achieve, led by states
  - Completed in April 2013
- Adopted by Washington (2013)
  - "Washington State 2013 K-12 Science and Learning Standards"





## A New Vision for Science Education

# SCIENCE EDUCATION WILL INVOLVE LESS...

Memorization of facts and terminology

- Teachers providing information to the whole class as primary delivery of lessons
- Oversimplification of activities for students who are perceived to be less able to do science and engineering

#### SCIENCE EDUCATION WILL INVOLVE MORE...

- Facts and terminology learned in context of developing explanations and designing solutions with evidence-based arguments
- Students conducting investigations, solving problems, and engaging in discussions
- Provision of supports so that all students can engage in sophisticated learning in science and engineering practices

# Defining the Need

FOSS (CURRENT PROGRAM)

- Based on outdated standards
- No engineering embedded
- No updates or changes since 2004

#### RECOMMENDED CURRICULUM

- Aligned with Next Generation Science Standards, with engineering practices, crosscutting concepts and disciplinary core ideas
- Authentic, relevant, and engaging
- Embedded research-based effective instructional practices
- Continually updated for duration of adoption

# Review of the Science Adoption Process

#### K-5 Science Adoption Process



- Researched
   Effective Practice
- Learned About Standards
- Standards Training for Teachers
- Developed Rubrics



- Finalized Rubrics
- Continued Standards Training in buildings
- Reviewed & Piloted Materials
- Recommended to IMC and Board

#### Year 3 (if approved)

- Implement Curriculum
- Provide Professional Learning
- Monitor Implementation

#### K-5 Science Adoption Committee

Representation from teachers, administrators, community members, parents, and specialists

- Schools from all learning communities
- Balanced representation across K-5
- Specialists from Intervention, Professional Learning, Teaching and Learning, and Technology Integration

DIRECTOR			
Dr. Jennifer Rose	Teaching & Learning		
ADMINISTRATORS			
Lucy Davies	Rush		
lan Maver	Audubon & Kirk		
Ryan Scott	Franklin & Rockwell		
Megan Spaulding	Mann		
TEA	TEACHERS		
Cody Aguirre	5th Grade, Redmond El.		
Kathy Aslamy	4 <sup>th</sup> Grade, Blackwell		
Teresa Barber	4th/6th Grade Quest, Smith		
Kimberly Beckwith	1ª Grade, Frost		
Abigail Bien	5 <sup>th</sup> Grade, Blackwell		
Mary Binder	Learning Center, Keller		
Chris Carter	4 <sup>sh</sup> Grade, Baker		
Monique Celeste	5 <sup>th</sup> Grade, Audubon		
Michelle Cody	2 <sup>nd</sup> Grade, Franklin		
Anne Cushman	Kindergarten, Rosa Parks		
Ellen Drummond	2 <sup>re</sup> Grade, Twain		
Susan Gabica	5 <sup>th</sup> Grade STEM Program, Mead		
Kayce Gehring	4 <sup>e</sup> Grade, Barton		
Kelly Gilbert	2rd, 3rd, 4rd, & 5th Grade, Emerson K-12		
Janel Hofmeister	1 <sup>#</sup> Grade, Einstein		
Davle Ishii	5 <sup>e</sup> Grade, Thoreau		
Tammi Liberda	2 <sup>rd</sup> Grade, McAuliffe		
Shar Luck	1* Grade, Carson		
Diann Mangan	5 <sup>a</sup> Grade, Juanita		
Marissa Meadows	3 <sup>rd</sup> Grade, Wilder		
Shannon Palermiti	2 <sup>rd</sup> & 3 <sup>rd</sup> Grade Quest, McAuliffe		
Kristi Petereit	4 <sup>th</sup> & 5 <sup>th</sup> Grade Quest, Rosa Parks		
Meredith Rapp	1 <sup>st</sup> Grade, Rockwell		
Barb Roy	3rd Grade, Discovery & Sandburg		
Melanie Stevens	1ª Grade, Mann		
Christine Tucker	Kindergarten, Muir		
Braelyn Williams	Kindergarten, Rose Hill		
Damaly Wingert	5 <sup>e</sup> Grade, Rush		
Ashlev Zednick	1* Grade, Keller		
Suzanne Zeitz	5 <sup>th</sup> Grade, Alcott		
COMMUN	TY MEMBERS		
Maggie Windus	Redmond Learning Community		
SPEC	CIALISTS		
Aubrev Dane	Technology Integration Specialist		
Jennifer Driftmier	Professional Learning Coach		
Alice Humphres	Teaching and Learning Specialist		
Teresa Pellett	Teaching and Learning Specialist		
Elyse Reynolds	Assistive Technology Specialist		
Karen Ripley	Professional Learning Specialist		
Nichole Rodriguez	Elementary EL Program Specialist		
Hanna Seidler	Teaching and Learning Specialist		

# Community Engagement

2017-Present: Regular updates on District website

January 2019:

- Parent letter
- Information shared at conferences

March 2019:

- Parent/community information night
- Direct email to all elementary parents

Connections:

- February 2019: Update on adoption process
- March 2019: Invitation for feedback with link to digital materials and digital survey link

# Teacher Engagement

Elementary Curriculum Newsletter:

 Monthly updates emailed directly with articles on Next Generation Science Standards implementation or the K-5 science curriculum adoption

#### **LEAP Sessions:**

- In building training facilitated by teachers working with or on the adoption committee
- Centered around effective practices in teaching science

#### NGSS Learning Cohort:

 Additional teacher representative in each building trained to support adoption and implementation

# Evaluating Instructional Resources

Rubrics:

- Next Generation Science Standards Alignment
- Assessment
- Effective Practice
- Organization and Design
- Digital Resources

### Rubric Development

Research and Learning:

- Next Generation Science Standards learning, including the instructional shifts of the standards
  - NGSS Appendix A
- Framework for K-12 Science Education research review
  - National Research Council
- University of Washington College of Education Partnership for Professional Learning
  - <u>Ambitious Science Teaching</u>; Dr. Kat Laxton

#### Science Programs Reviewed

- Amplify Science
   FOSS (Delta Education)
- Bring Science Alive! (TCI)
   Inspire Science (McGraw Hill)
- Building Blocks of Science
   KnowAtom 3D (Carolina)
- Elevate Science (Pearson)
   Mystery Science
- Engineering is Elementary
- Science Dimensions (Houghton Mifflin)

 Exploring Science (National Geographic) • STEMScopes

## Programs Selected for Field Testing

#### Amplify Science

Publisher: Amplify Copyright 2018



#### **Building Blocks of Science 3D**

Publisher: Carolina Biological Supply Company Copyright 2019



## Classroom Testing and Surveys

- Teachers tested both publisher materials in the classroom
- Teachers completed a feedback survey at the end of each round
- Students completed surveys following each round
  - "I liked how everybody was included in the class discussions."
  - "I liked that, we learned other things when learning about the models and it helped me learn a lot from just models."
  - "I liked how we could explain our ideas while watching how they work or don't work."

# Community/Parent Input

Parent/Community Information Night

Background on adoption process

Opportunity to review piloted curricula and give feedback

Parent/Community Feedback Survey
"Amplify Science feels like an application built for elementary school kids in the 21st century."

 "Amplify seems like a much more innovative choice. Its focus seems to be more on teaching scientific thinking and less on scientific facts. I think that it's more important to teach scientific thinking so I lean towards Amplify."



# Community/Parent Input



#### Public Review of Materials and Input

	Lake Washington School District	APPENDIX C
April 4 – May 2	Public Review of Materials	
Instructional Materials Policy Appendix C Review of Materials Form	To: LAKE WASHINGTON SCHOOL DISTRICT BOARD OF DIRECTORS   FROM:	

## Recommendation Decision

Members of the K-5 Science Adoption Committee evaluated all data gathered during review and pilot process.

There was unanimous support for recommending **Amplify Science** as the appropriate curriculum to meet the needs of all elementary students at Lake Washington School District.

Kit-BasedIncludes Digital Resources

#### Committee Member Presenters

Annie Cushman: Kindergarten, Rosa Parks Janel Hofmeister: 1st, Einstein Michelle Cody: 2nd, Franklin Shannon Palermiti: 2nd/3rd Quest, McAuliffe Chris Carter: 4th, Ella Baker Kayce Gehring: 4th, Clara Barton Cody Aguirre: 5th, Redmond Mary Binder: Learning Center, Keller



# Next Generation Science Standards (NGSS)

RIGOROUS AND RELEVANT

# **3-Dimensional Learning**





## **Disciplinary Core Ideas**

K: LS1.C: Organization for Matter and Energy Flow in Organisms: All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

2: ESS2.C: The Roles of Water in Earth's Surface Processes: Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.

4: **PS3.B Energy:** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.







## **Crosscutting Concepts**

Spiraling concepts within units and across grade levels helps all students access and internalize science concepts.

- K: systems and system models, scale, proportion, and quantity, cause & effect
- 2: scale, proportion, and quantity; stability and change, cause and effect
- 4: systems and system models, energy and matter, cause and effect





#### Science and Engineering Practices



\* Chunks broke off and at white

\* Smooth look.

water.

## **Engineering Practices Incorporated**

#### Engineering-focused unit embedded in every grade level







# Effective Science Instructional Practices

INNOVATIVE AND INDIVIDUALIZED

## Phenomenon Driven

Anchoring phenomenon modeled after real world problems allow students to connect science learning to the world around them.

- K: Needs of Plants and Animals:
- Milkweed and Monarchs
- 2: Changing Landforms:
  - The Disappearing Cliff
- 4: Energy Conversions:
  - Blackout in Ergstown



## Rigorous and Accessible Design

Student engagement is intentionally provided through relevant, authentic science connections

- "I liked that we helped them."
   Kindergarten student referring to the Mariposa Grove Kids
- "I learned A LOT about molecules and the chemistry of food. It was often very engaging and fun." – 5<sup>th</sup> grade

How do you feel about our science unit? Primary (K-2) Responses (n=277)



How do you feel about our science unit? Intermediate (3-5) Responses (n=409)



# Cross-Disciplinary Skill Application

Embedded in Amplify

- Lessons that incorporate researchbased literacy practices
- Writing tasks that focus on analyzing and explaining science ideas
- Opportunities to extend in other content areas





# Individualized Digital Student Books

High quality non-fiction texts:

Highlights key concepts

Vocabulary



Gibor Basri first became interested in science in third grade, when he started reading science fiction stories. His dad bought him a small telescope, and he used it to watch the stars from his bedroom window at night. Basri says, "I remember Orion would go by in the winter."

Today. Basri is an **astronomer**—a scientist who **investigates** stars. Basri asks questions like: How do stars form? What are the smallest stars like? How do stars change over time?

# Individualized Digital Resources

Simulations:

- Self-guided, interactive models designed to:
  - Stimulate critical thinking
  - Support student growth
  - Meet the needs of students across various levels



# Individualized Digital Resources

Digital Tools:

 Digital resources for students that solidify conceptual understandings





# Organization and Design

#### DIFFERENTIATED AND EQUITABLE

## Equitable and Accessible

#### Text Support

- Multiple texts to support each lesson
- Modified handouts to be used with students who are English Language Learners or in Special Education
- Assessments are differentiated



## Equitable and Accessible

#### **Online Resources**

- Student readers with audio capabilities
- Embedded projections that contain visuals of concepts in each lesson
- Simulations/diagrams
- Digital access to support teachers



# Equitable and Exceptional



## Rigorous and Accessible Design

- Dynamic curriculum updates, ways to keep practice relevant and engaging
- Strong content support for teachers to effectively engage students in deep science learning
- Immediate teacher support built in



Planning for the Unit





# Next Steps

# Next Steps if Materials Approved

- Professional learning for initial implementation for all elementary teachers
- Barcoding materials and delivering to schools
- Development of alignment guides
- Planning sustained implementation and on-going professional learning over time for all elementary teachers

# Questions

