Endeavor STEM Leadership Seminar Final Project: Integrating Literacy into the Next Generation Science Standards

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I. Title of Professional Development:

Integrating Literacy into the Next Generation Science Standards

II. Curriculum Topic:

Science is full of discovery, excitement, and mystery, making it the perfect vehicle to ignite student interest while gaining literacy skills. Using a variety of collaborative conversation and literacy strategies in a deliberate manner, students will not only understand more science, but they will also become better readers, writers, and thinkers. Through my Endeavor courses such as *Reading and Writing Across the Science Classroom* and *The Arts in STEM: Advancing Meaningful Integration,* I have learned how to incorporate literacy instruction into the science curriculum. Participants in this workshop experienced an engaging NGSS phenomenon-based lesson sequence and learned techniques for including all students in sense-making and shared their ideas through productive dialogue, purposeful reading, and meaningful writing.

School Information:

Mariposa Avenue Elementary School is a K-5 school located in Citrus Heights, California. The school has a population of 377 with 47% Caucasian, 38% Hispanic, 5% African American, 4% Asian, and 6% other. Approximately 24% are English Learners and 17% qualify for Special Education services. We are a Title 1 site with 84% eligible for free or reduced breakfast and lunch.

Participants:

This professional development opportunity was offered to all the teachers at the school site during a professional day after school. Participants were two kindergarten teachers, two first grade teachers, two second grade teachers, two third grade teachers, two fourth grade teachers, two fifth grade teachers, two SDC teachers, a resource teacher, Title 1 coach, and an ELD teacher and an administrator.

III. NGSS Standards: 3-PS2 Motion and Stability: Forces and Interactions

- **3-PS2-1.** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- **3-PS2-2.** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion
- **3-PS2-3.** Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
- **3-PS2-4.** Define a simple design problem that can be solved by applying scientific ideas about magnets.

IV. Summary:

The purpose of this professional development was to help educators outline the process that one might take in developing a curriculum that intertwines the three dimensions of the NGSS (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts) and scientific literacy. Our school currently uses Benchmark Advance for ELA, which most teachers find challenging to fit the needs of the majority of our students. We also use FOSS science curriculum, with very few teachers actually teaching science. My hope is that after attending this session, teachers will try integrating literacy activities into their science classroom and understand that these strategies can play a vital role in achieving a minds-on or metacognitive

approach to the learning of literacy and science. Many of the activities in the presentation I have used in my own third-grade classroom.

V. Pre-Questions Survey:

1. Have you integrated reading and writing into your science instruction?
    a. Yes
    b. No
    c. Unsure
2. If yes, please give an example.

3. Have you used a science notebook with your students?
    a. Yes
    b. No
    c. Unsure

4. If yes, how frequently do you use them?
    a. Never
    b. At least once/week
    c. At least once/month
    d. At least once/year

VI. Description of Training:

The training was held in a classroom with participants seated at tables in groups of four. Using a strategy from a flipped classroom instructional model, I sent participants the powerpoint presentation and the articles for them to view before the training, in hopes they were motivated and excited about attending. I used the powerpoint to guide the session with each slide which presented a video or described the activity or discussion questions. Teachers were given time to talk with their partners and to share out when appropriate. They were encouraged to use their science notebooks to take notes and to write questions. The participants had access to computers but did not use them. The training lasted 1.5 hours and I could have gone longer.

VII. Brief Outline of the Activities in the PD:

To demonstrate how to integrate literacy into the NGSS, I used a third-grade science unit on 3-PS2 Motion and Stability: Forces and Interactions and combined literacy strategies into the lessons. Teachers were able to experience the tasks as a student, and then reflect and collaborate as an educator.

1. Pre-survey
2. Quick write in science notebooks: “Why is productive talk important for learning science?” Discussed norms of engagement and teamwork.
3. Introduced interactive science notebooks
4. Formative assessment probe
5. Discussed NGSS and CCSS
6. Phenomena driven instruction
7. Magnet exploration and observation
8. Discussion and discovery

9. Forces and motion reading using Benchmark, Project 3D-View, MyOn, and Seeds of Science
10. Investigation and productive talk
11. Engineering activity: Design a better swing
12. Gallery walk using post-its for comments and revised own design of swing
13. Revisited phenomena and discuss
14. Debriefed, answered questions and spoke about NASA resources
15. Post-survey

VIII. NASA data included:

1. NASA phenomena website: https://nasaeclips.arc.nasa.gov/video/ourworld/our-world-what-is-an-extremophile
2. Newsela: https://newsela.com
3. Page Keeley Formative Assessment Probes: https://www.ode.state.or.us/teachlearn/subjects/science/resources/msef2010-formative_assessment_probes.pdf
4. Phenomena for NGSS: https://www.ngssphenomena.com
5. Project 3D-View: http://www.3dview.org/index.cfm
6. Seeds of Science- Roots of Reading: http://www.scienceandliteracy.org
7. Next Generation Science Standards https://www.nextgenscience.org/dci-arrangement/3-ps2-motion-and-stability-forces-and-interactions

IX. Follow-up Activities:

Our school site has been transitioning to a STEM campus, so much of our professional development training is dedicated on how to use more STEM activities in our classrooms. After I presented my PD, and during our subsequent meetings, I have taken a few minutes to check in with my colleagues to ask if they have had success integrating literacy into their science instruction and encouraged them, if not. I have offered to help staff choose thoughtful and purposeful reading materials that complement their science instruction. I have also invited staff to come into my classroom to see me teach a lesson using literacy strategies in my science lessons.

Post-questions survey:

At the end of the professional development session, teachers completed the following survey:

1. Do you better understand how to apply reading and writing strategies to enhance students' understanding of science content?
    a. Yes
    b. No
    c. Unsure

2. Will you use some of the strategies in your classroom?
    a. Yes
    b. No
    c. Unsure

3. If yes, which strategies will you try?

X. Outcomes:

a. The result I hoped to see by presenting this professional development was to encourage teachers at my school site to recognize literacy engagement and its role in the science classroom. We have a school full of low and reluctant readers and for students to understand science content, reading engagement is key.

   Before the professional development, most of the teachers (89%) surveyed said they had integrated reading and writing into their science instruction. When asked to give a specific example, however, only a few stated that they used non-fiction texts and most did not answer. Only one said they had used a science notebook in their classroom.

b. After the training, 100% of teachers on the post-survey, stated that they better understood how to apply reading and writing strategies to enhance students' understanding of science. All of the participants said they would try some of the literacy strategies presented in their classrooms. Strategies noted that they were interested in trying were presenting phenomena, science notebooks, dialogue cards, wonder/noticings and using anticipation reading guides.

c. I feel my professional development session was a success! This was the first training I have developed and then presented alone. I was nervous. I teach yoga classes, sometimes to over 50 people without a qualm! Once I got started, however, my nervousness subsided and I really had fun! I received several positive comments such as, "The lesson continually connected writing, reading and language with science concepts and practices" and "That was fun and I am more confident about using reading and writing with science!" I feel I successfully presented strategies to help teachers weave hands-on investigations of science content with purposeful literary curricula.

d. When reflecting on the course readings, the article "A Primer on Effective Professional Development" by DeSimone (2011) related to my project. DeSimone notes there are a core set of five features common to effective professional development. These include content focus, active learning, coherence, duration, and collective participation. My professional development session accomplished four of the five core features. The focus of my presentation was how to integrate literacy into the Next Generation Science Standards. There was active learning as teachers experienced the strategies as a student would through pair/shares, using a science notebook, magnet explorations, and a collaborative hands-on engineering task. This topic had coherence as it was directly related to state academic content standards and was a continuation of previous professional development our staff has had on STEM education. In addition, collective participation occurred because teachers sat together and interacted with content specific to their grade level NGSS. The missing feature was duration as the training will not be sustained and intensive. To achieve duration, I am hopeful that my professional development will inspire staff to attend more training to continue their quest for STEM education.

In addition, I identified with the Luft et al. (2016) article "Science Teacher Leadership: Learning from a Three-year Leadership Program." I have never considered myself a leader at my school site. Sometimes, educators, like myself, have not felt confident with their leadership skills because they don't consider themselves an "expert" or leader in their field. I believe this is why many teachers hesitate to step outside their classrooms to share their expertise with others. I have discovered that all teachers have varying levels of leadership qualities and that their vision for change extends beyond their own classrooms. When educators are given the opportunity to learn among other teachers with an individual professional learning plan that has specific learning objectives, as well as support from administration, they may become a teacher leader.

Since taking the STEM Leadership course which required me to plan and then present my professional development, I feel confident and am eager to take on a leadership role in STEM education at my school or beyond.

e. From my survey results, it appears some teachers will use the strategies and resources from my training. Our school site focus this year has been increasing literacy and implementing STEM activities. Many teachers have expressed frustration about finding the time to teach science in their classrooms when we are really focusing on reading instruction and how to raise our test scores. My presentation gave teachers some tools and strategies to integrate literacy and NGSS. I have had several teachers inquire about the materials I used in my training and how they can use them to support their students' learning. I will continue to check-in with my staff and encourage them to attend additional professional development in STEM education.

f. This experience has helped me grow as a teacher and as a leader. I have always sought to understand how my students learn and how I can improve my skills as their teacher. One way has been through programs like Endeavor which provided me new instructional skills and methods of classroom practices in STEM education. I enjoyed the opportunity to share what I have learned with my colleagues through my professional development session. As a result of my efforts, I have encouraged STEM culture and ideas about STEM education, as well as provided effective strategies for changing my colleagues' perceptions and implementing change. I am planning to pursue more professional development opportunities to promote STEM instruction and I feel more confident about developing my teacher leadership skills.

XI. Appendices: List of Classroom Activities/Unit with Assessment:

A: Google Slides used for PD workshop. Link: https://docs.google.com/presentation/d/1TIj61FtnUomAJ5IGa634qkjeQIorx1R6B5dMtmmjuBk/edit?usp=sharing

B: List of classroom activities

C: Participant Contact Information

References

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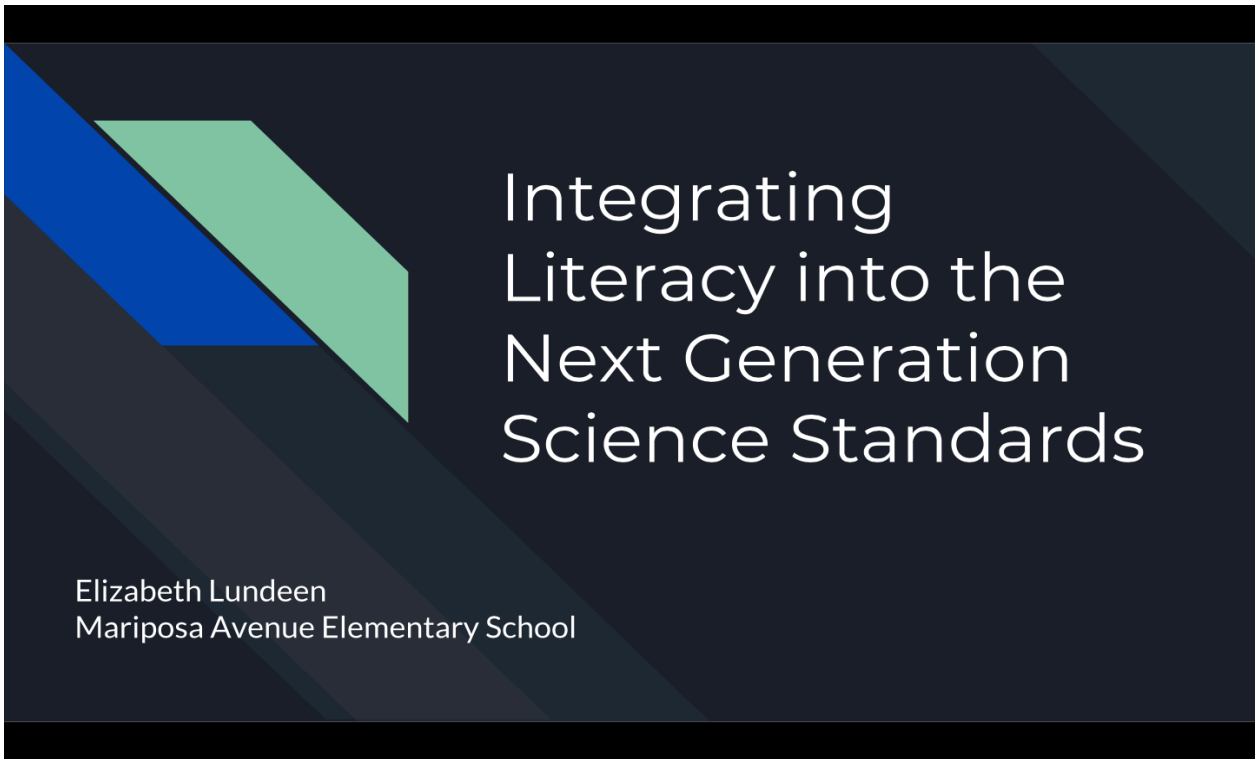
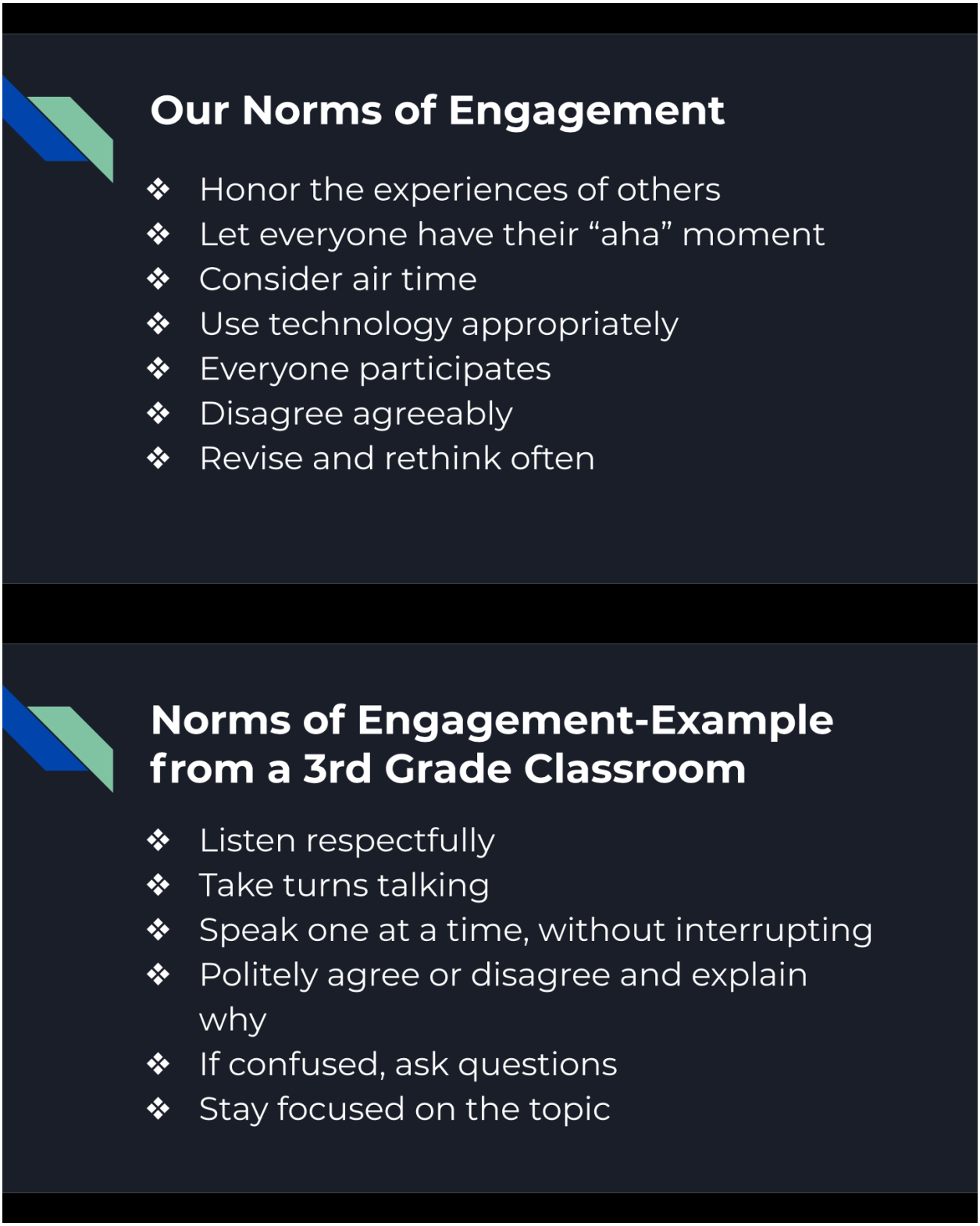
Appendix A

Google Slides used for Professional Development workshop




Our Norms of Engagement
Honor the experiences of others
Let everyone have their “aha” moment
Consider air time
Use technology appropriately
Everyone participates
Disagree agreeably
Revise and rethink often
Norms of Engagement-Example from a 3rd Grade Classroom
Listen respectfully
Take turns talking
Speak one at a time, without interrupting
Politely agree or disagree and explain why
If confused, ask questions
Stay focused on the topic

Creating a Science Interactive Notebook

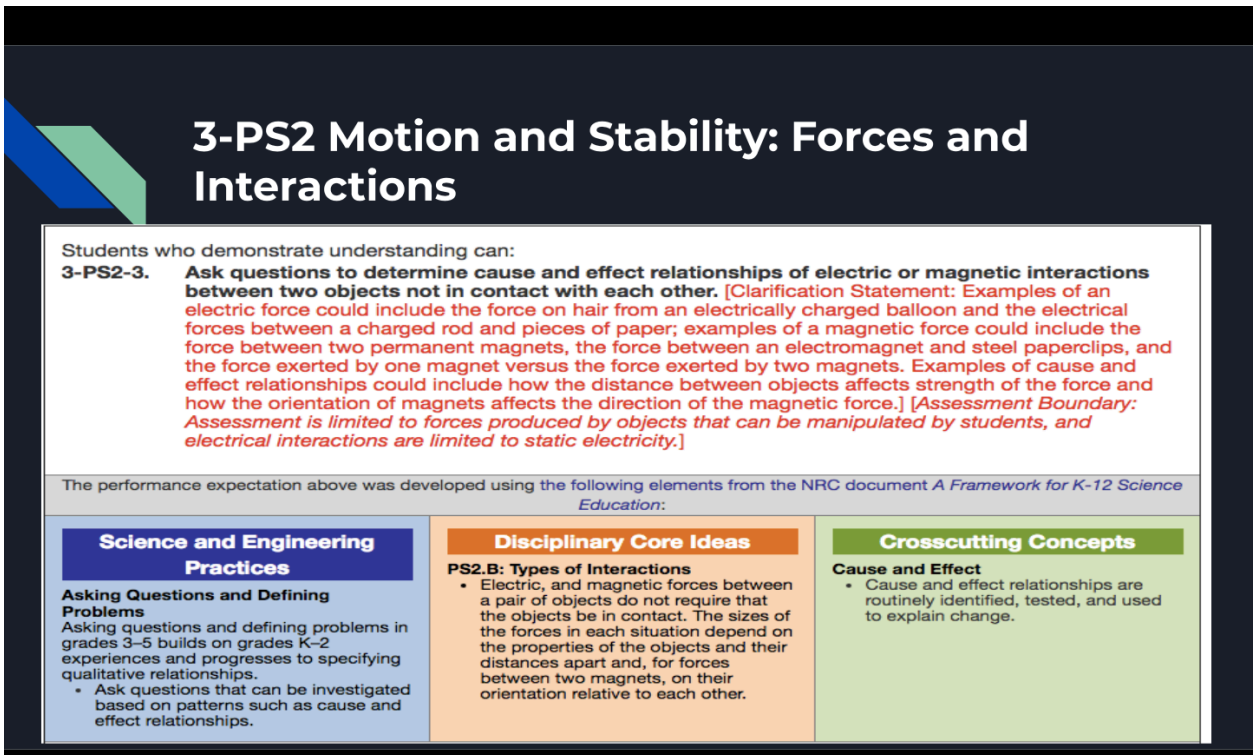
Science interactive notebooks fill many roles. They promote students' science learning and give students an opportunity to enhance their writing skills. They help students better appreciate the process of scientific inquiry. They help students organize their learning and, by the end of the unit, realize how much they have learned. For teachers, the interactive notebook is a unique means of assessing student learning and organization.

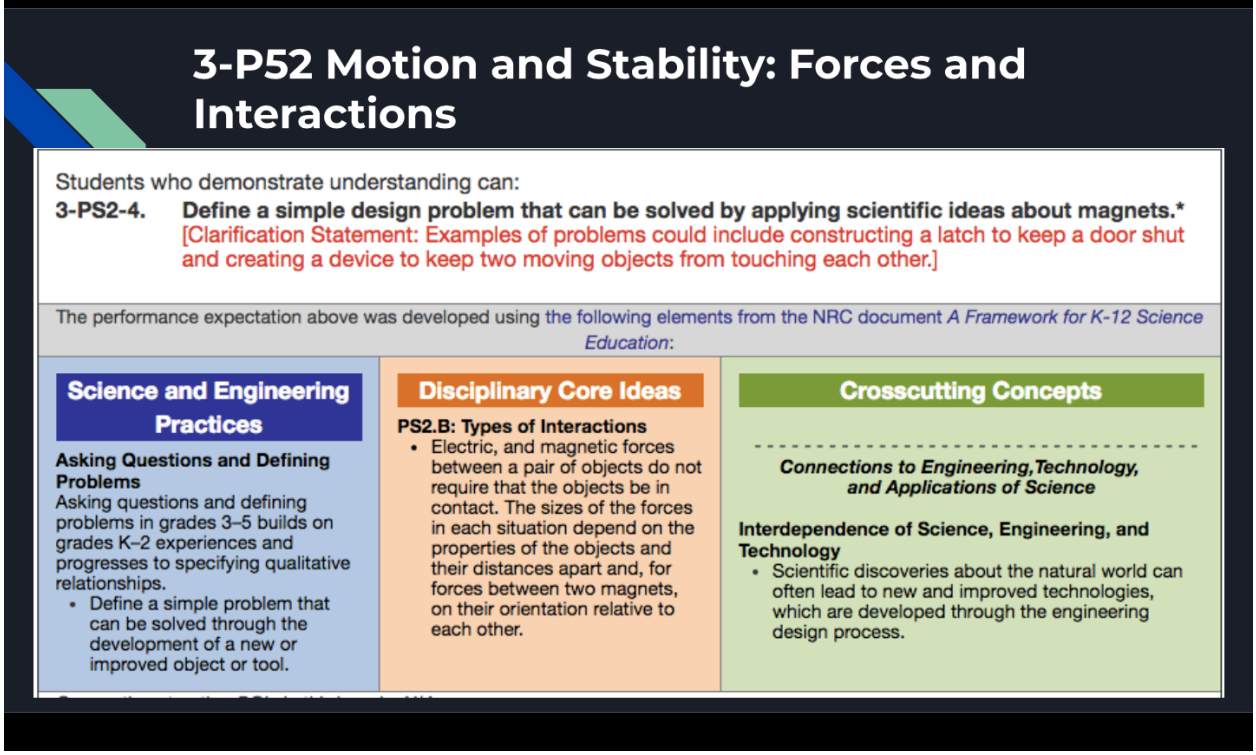
An excellent website explaining how educators can have students set up their science notebooks can be found at:
https://www.calacademy.org/educators/setting-up-your-science-notebooks

Snail Investigation-3rd Grade

https://www.exploratorium.edu/education/ifi/inquiry-and-eld/educators-guide/snail-investigation?media=7210

- What aspects of literacy do you notice during this video clip?

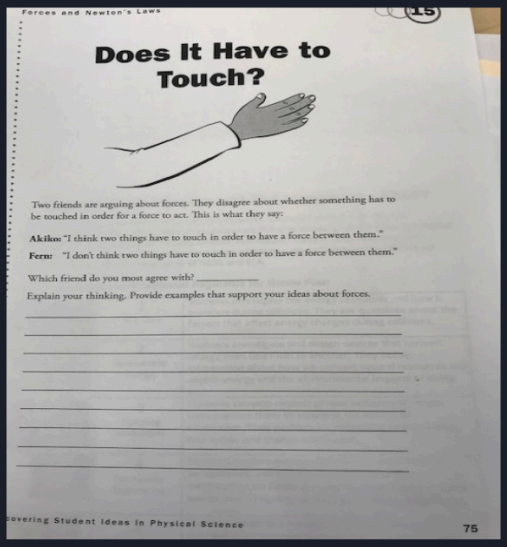

3-PS2 Motion and Stability: Forces and Interactions
Students who demonstrate understanding can:
3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.] [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.]
The performance expectation above was developed using the following elements from the NRC document A Framework for K-12 Science Education:
Science and Engineering Practices
Asking Questions and Defining Problems
Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
• Ask questions that can be investigated based on patterns such as cause and effect relationships.
Disciplinary Core Ideas
PS2.B: Types of Interactions
• Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.
Crosscutting Concepts
Cause and Effect
• Cause and effect relationships are routinely identified, tested, and used to explain change.


3-P52 Motion and Stability: Forces and Interactions
Students who demonstrate understanding can:
3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.* [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]
The performance expectation above was developed using the following elements from the NRC document A Framework for K-12 Science Education:
Science and Engineering Practices
Asking Questions and Defining Problems
Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
• Define a simple problem that can be solved through the development of a new or improved object or tool.
Disciplinary Core Ideas
PS2.B: Types of Interactions
• Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.
Crosscutting Concepts
Connections to Engineering,Technology, and Applications of Science
Interdependence of Science, Engineering, and Technology
• Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process.

Does It Have to Touch?

A formative assessment probe includes questions informed by standards and research on student learning that uncover students' ideas and ways of reasoning about common science topics.

These probes can be effective tools to help teachers build a bridge between students' initial ideas and scientific ones.


Forces and Newton's Laws 15

Does It Have to Touch?

Two friends are arguing about forces. They disagree about whether something has to be touched in order for a force to act. This is what they say:

Akiko: "I think two things have to touch in order to have a force between them."

Fern: "I don't think two things have to touch in order to have a force between them."

Which friend do you most agree with? _____

Explain your thinking. Provide examples that support your ideas about forces.

Uncovering Student Ideas in Physical Science 75

Phenomenon Driven Instruction- What Do You Notice and Wonder?

Explore With Magnets

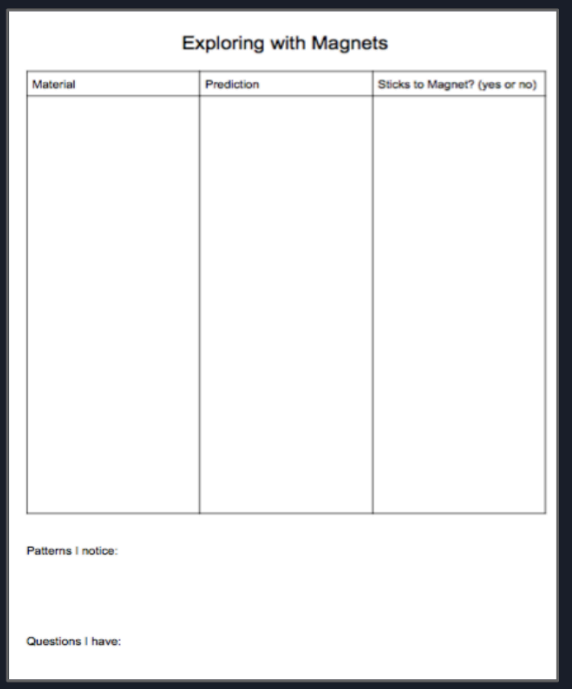
- In your notebooks write:
  - Your observations with words/pictures
  - Any questions you may have

Sharing Our Findings Using Dialogue Cards

Students are in groups of 4. Each person takes a turn sharing one observation about magnets with their group by putting their colored card in the middle of the table. After everyone has had a chance to speak, the process can be repeated.

More magnet explorations

- What sorts of things do magnets stick to?
- Make predictions and test different materials
- Record your predictions and results in your notebook



Exploring with Magnets

Material	Prediction	Sticks to Magnet? (yes or no)

Patterns I notice:

Questions I have:

What have we discovered about magnets?

In science notebooks, students respond using sentence stems:

I have discovered that...

I observed....

I noticed...

I think _____ because _____.

I'm curious about...

Benchmark Advance and NGSS Alignment

***Benchmark Advance* NGSS Alignment**

Grade 3			
Grade	**Unit**	**Topic**	**Standard**
3	3	Animal Adaptations	**3-LS3-1.** Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. **3-LS3-2.** Use evidence to support the explanation that traits can be influenced by the environment.
3	5	Advancements in Technology	**3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3	8	Weather and Climate	**3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. **3-ESS2-2.** Obtain and combine information to describe climates in different regions of the world. **3-ESS3-1.** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
3	10	Forces and Interactions	**3-PS2-1.** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. **3-PS2-2.** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion **3-PS2-3.** Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other **3-PS2-4.** Define a simple design problem that can be solved by applying scientific ideas about magnets.

Magnet reading

- Benchmark: Grade 3 Unit 10 Extended Read 2: Investigate Magnetism pp. 22-29
- FOSS Science Resources Grade 4 pp. 3-7+
- Internet has many options

Extended Read 2

Remember to annotate as you read.

Notes

Investigate Magnetism

by Drake Conyers

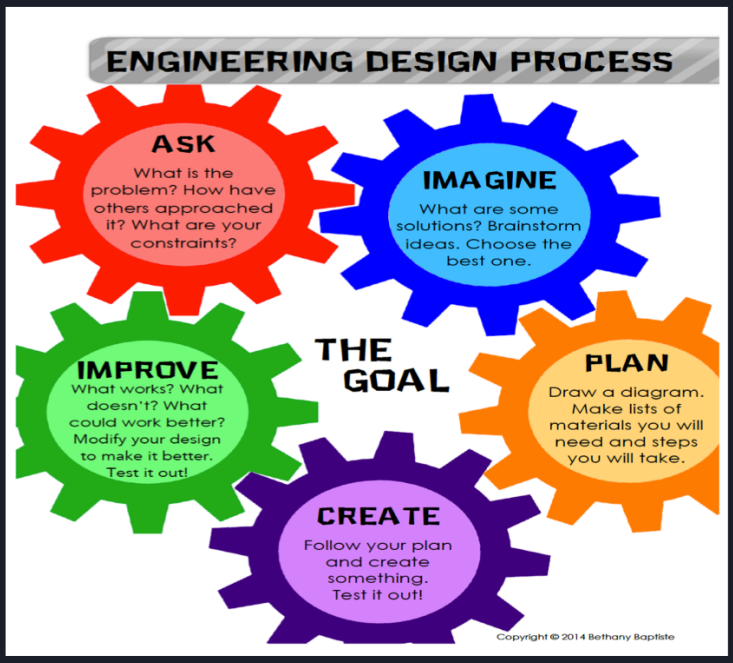
1 It is early morning at the scrapyard. The crane operator adjusts her hard hat and climbs up into the control compartment of the crane. She turns the key and starts the engine. She flips on the control panel. Then she moves a series of levers to adjust the lifting arm. Workers shout orders over the low hum of the crane. She puts the arm in position, raising it high into the sky. Then she swings it over a massive heap of scrap metal. The pulley attached to the crane holds a large, round metal disc. It looks like a giant hockey puck dangling over the old pipes, car parts, and metal scraps of every shape and size.

Different-sized magnets exert different levels of magnetic force.

Design an investigation about magnets: Focus on Cause and Effect

- How does distance between magnets affect the strength of the force?
- How strong are different types of magnets?
- How does the number of magnets affect the strength of the force?

Task: Engineering a Better Swing



Design an investigation about magnets: Focus on Cause and Effect

- How does distance between magnets affect the strength of the force?
- How strong are different types of magnets?
- How does the number of magnets affect the strength of the force?

Gallery Walk

1. Walk around to view swings built by other groups
2. Add your feedback using Post-Its
3. Return to your group's design and make any revisions to improve the effectiveness of your swing

Revisiting the Phenomenon

- Students write an explanation of how the sorter works using what they figured out about the rules of magnetic force.
- They must cite evidence from their explorations, text, and using engineering design.

Debrief- Opportunities for Talk

- What opportunities did students have for productive talk in this lesson?
- What are some ways to ensure equity of voice?
- What is the importance of setting norms for productive talk?
- In what ways did productive talk help students make sense of science?

NASA resources to use in the classroom

- Project 3D-View http://www.3dview.org/index.cfm
- NASA for Educators https://www.nasa.gov/audience/foreducators/index.html
- NASA eclips https://nasaeclips.arc.nasa.gov/video/ourworld/our-world-what-is-an-extremophile
- Newsela https://newsela.com/
- Page Keeley Formative Assessment Probes https://www.ode.state.or.us/teachlearn/subjects/science/resources/msef2010-formative_assessment_probes.pdf
- Phenomena for NGSS https://www.ngssphenomena.co
- Seeds of Science- Roots of Reading http://www.scienceandliteracy.org

Appendix B

List of Classroom Activities Used in PD

The classroom activities I presented were strategies and resources integrating literacy with NGSS. They are all learning tasks that can be used in the classroom. The participants experienced the activities as if they were students. The activities below correlate with the Google Slide presentation I used to guide the session.

Introduction: The session began with a quick write. Each teacher was given a science notebook in which they answered the question "Why is productive talk so important for learning science?" Teachers shared their thoughts with a partner.

Building Teamwork- We discussed the norms of engagement for our teacher session and how norms of engagement can be used for our own students when working in a group. This can be done collaboratively with a class and displayed. Examples found at https://www.exploratorium.edu/sites/default/files/pdfs/ifi/ScienceTalk.pdf

Science Interactive Notebooks- I walked the teachers through how to set up a science notebook. Teachers watched a video with third-grade students using their notebooks as they observed snails during an inquiry and investigation lesson. https://www.exploratorium.edu/education/ifi/inquiry-and-eld/educators-guide/snail-investigation?media=7210

Asked, "What aspects of literacy do you notice during this video clip?" Teachers shared out.

Science interactive notebooks fill many roles. They promote students' science learning and give students an opportunity to enhance their writing skills. They help students better appreciate the process of scientific inquiry. They help students organize their learning and, by the end of the unit, realize how much they have learned. For teachers, the interactive notebook is a unique means of assessing student learning and organization.

Read this quote: According to Azimioara et al. (n.d.) "Writing is one of the ways that children learn in science…When students explain what they have seen and why they think this occurs in writing, they are forced to clarify their thoughts and organize these ideas in a way that others can understand."

An excellent website explaining how educators can have students set up their science notebooks can be found at https://www.calacademy.org/educators/setting-up-your-science-notebooks

Formative Assessment Probe- Teachers completed "Does It Have to Touch?" formative assessment probe. Formative assessment probes and FACTs support the development of communication skills in science and mathematics. Formative assessment can provide opportunities for students to share their thinking and engage in rich discourse and argumentation using evidence-based reasoning. Teachers shared their responses with a partner. Then students paired up and discussed their answers. Handed out colored index cards for pair- share questions which included sentence starters.

NGSS and CCSS - Common Core ELA standards are woven into the NGSS. If you think about NGSS as a tapestry, it would be made of five threads: science and engineering practices, disciplinary core ideas, crosscutting concepts, English language arts, and mathematics. The NGSS is designed to really have all of these kinds of skills, knowledge, and disciplines work together.

Show the example of the Performance Expectations from the NGSS Standards. Explain Science and Engineering Practices, Disciplinary Core Ideas and Crosscutting Concepts. https://www.nextgenscience.org/

California NGSS Science Standards: **https://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp**

California Science Framework: **https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.asp**

Phenomena Driven Instruction- Showed the phenomena video of a magnetic sorter. Video can be found at https://youtu.be/nvJFFIzAwqI

Teachers drew a line on their notebook page- Notice/Wonder. Participants made note of what they noticed in the video and what they wonder about after watching.

Write noticings first, share with a partner - person whose birthday is closest to today goes first.

Write wonderings next, share with partner.

Together with a partner, write one big wondering on paper with a marker and tape it to the wall to share as a group. Talk about the use of phenomena to engage students and arouse their curiosity.

Some great phenomena videos can be found at https://nasaeclips.arc.nasa.gov/video/ourworld/our-world-what-is-an-extremophile

Magnet Exploration- Passed out one doughnut magnet to each person, allowed time to play and observe it. In notebooks, participants made observations about the magnet using ideas, words or pictures and wrote any questions they may have.

Dialogue Dots- Shared our findings using dialogue cards. Students in groups of 4. Each person takes a turn sharing one observation about magnets with their group by putting their colored card in the middle of the table. After everyone has had a chance to speak, the process is repeated.

Further Exploration- More magnet exploration as teachers investigated the following question, "What sorts of things do magnets stick to?" Made predictions and tested different materials in zip-lock bag using a worksheet.

https://docs.google.com/document/d/19ZyWjKcnEDN8dVfZHC8Qi50Oyg6dG6MVtavlYCkrVV4/edit?usp=sharing

Teachers recorded predictions and results in their notebook.

Discovery- Charted model statements on chart paper asking "What have we discovered about magnets?" Teachers wrote responses in notebooks.

Examples:

1. Magnetic forces can act at a distance.
2. Magnets can push or pull each other depending on which sides are facing each other.
3. Magnetic strength depends on distance apart.

Sources of Reading in Science- Passed out samples of literary text from Benchmark and FOSS about magnets. Discussed literacy strategies that can be used with the text. Discussed with a partner other strategies that could be used. Shared out to the group.

Investigation- With a partner designed an investigation about magnets. Considered the following questions, “How does distance between magnets affect the strength of the force?” “How strong are different types of magnets?” “How does the number of magnets affect the strength of the force?” Recorded thoughts in notebooks.

Design a Better Swing Activity- Each team designed a swing that uses magnetic force to keep the swing moving after an initial push. Materials: 2 feet of yarn, 2 ring magnets, binder clip, tape

Discussed success criteria on a chart and decided as a group. Examples:

1. It must move on its own after an initial push
2. Five full swings (up and back)

Gallery Walk- Participants walked around the room to view swings built by other groups, added feedback using Post-Its. Teachers returned to their own designs and revised to improve the effectiveness of their swing.

Revisit the Phenomenon- Students wrote an explanation of how the sorter worked using what they figured out about the rules of magnetic force in their science notebooks.

Debrief and Opportunities for Talk- Answered questions and spoke about NASA resources available for educators.

Appendix C
Participant Contact Information

1. Leslee Cottrell- Administrator leslee.cottrell@sanjuan.edu
2. Sandy Butler- 3rd-grade teacher sandra.butler@sanjuan.edu
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