

# I have 3 goals for you for the next 2 hours:

- I want you to know the Science Standards at your grade and at your bookend grade levels.
- I want you to know more about Project-Based Learning.
  - I want you to collaborate with your team about a STEM project you can create this year.

Please write **your** goals in your notebook.

# Real-world connections (video)







#### Practices in Mathematics, Science & Engineering, and Literacy Math Science & Engineering Literacy M1. Make sense of problems and S1. Asking questions (for science) Demonstrate independence in and defining problems (for persevere in solving them. reading complex texts, and writing and speaking about them. engineering). M2. Reason abstractly and L2. Build a strong base of knowledge quantitatively. Developing and using models. through content rich texts. M3. Construct viable arguments S3. Planning and carrying out L3. Obtain, synthesize, and report and critique the reasoning of investigations. findings clearly and effectively in others. S4. Analyzing and interpreting response to task and purpose. M4. Model with mathematics. data. L4. Construct viable arguments and M5. Use appropriate tools S5. Using mathematics, critique reasoning of others. information and computer strategically. L5. Read, write, and speak grounded technology, and M6. Attend to precision. in evidence. computational thinking. M7. Look for and make use of L6. Use technology and digital media S6. Constructing explanations (for structure. strategically and capably. science) and designing M8. Look for and express L7. Come to understand other solutions (for engineering). regularity in repeated perspectives and cultures through S7. Engaging in argument from reasoning. reading, listening, and evidence. collaborations. S8. Obtaining, evaluating, and communicating information.

#### Math Science M4. Models with mathematics M1: Make sense of problems S1: Ask questions and define S2: Develop & use models problems and persevere in solving them S5: Use mathematics & M2: Reason abstractly & \$3: Plan & carry out investigations computational thinking quantitatively \$4: Analyze & interpret data M6: Attend to precision S6: Construct explanations & E2: Build a strong base of knowledge M7: Look for & make design solutions through content rich texts use of structure E5: Read, write, and speak M8: Look for & grounded in evidence make use of E6: Use S8: Obtain. M3 & E4: Construct viable regularity technology evaluate, & arguments and critique in repeated & digital media communicate reasoning of others reasoning strategically & information S7: Engage in capably E3: Obtain, synthesize, argument from M5: Use appropriate and report findings clearly evidence tools strategically and effectively in response to task and purpose E1: Demonstrate independence in reading complex Commonalities texts, and writing and speaking about them **Among the Practices**

in Science, Mathematics and English Language Arts

Based on work by Tina Chuek ell.stanford.edu

E7: Come to understand other perspectives and cultures through reading, listening, and collaborations

ELA



# TEACHERS & SCHOOL LEADERS

### **Desired Outcomes:**

- Use standards-driven instruction
- Practice interdisciplinary instructional approaches
- Incorporate strong emphasis on literacy
- Increase content knowledge
- Provide opportunities for students to be immersed in the disciplinary practices
- Develop rigorous, relevant, realworld tasks
- Encourage family engagement

#### Behaviors & Influence

### **STUDENTS**

### **Desired Outcomes:**

- Are STEM literate
- Possess 21<sup>st</sup> Century competencies
- Demonstrate STEM workforce readiness
- Interested and engaged in learning
- Able to make the connections among STEM disciplines and Arizona Standards
- Participate as active and responsible citizens

### **Desired Outcomes:**

- · Support academic success
- Make real-lifeconnections for school and home
- Build partnerships with collaborative networks, clubs, and informal education organizations
- · Engage in mentoring opportunities
- Reinforce literacy skills

FAMILY & COMMUNITY

### BUSINESS & INDUSTRY

#### **Desired Outcomes:**

- · Employ more diverse workforce
- Encourage increased number of students going to college or career -technical training
- Value skilled, knowledgeable workforce
- Value 21<sup>st</sup> Century learners
- Create partnerships
- Provide internships and apprenticeships
- · Encourage family outreach

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ADE Support for STEM Literate Students





- Think:
  - What do you know about the <u>Science</u> standards at your grade level?
- Write:
  - Write Science standards for your grade level.
  - Use a different post-it note for each standard.
  - Stick it to your grade level poster.
- O Categorize:
  - As a grade level, categorize your post-it notes.

Break into your <u>LETTER</u> teams:

	K: Kimberly O. Margaret Laura Mary Angela Alexandra	1st: Katy Brandie Cynthia	<b>2nd:</b> Rachel C. Clarissa Danielle Kelli
	2nd: Monica Sheri Valerie	3rd: Lynnda Mayme Carlynn Jennifer	4th: Tanya Holly Deena
	5th: Cathleen Rachel H. Amy M.	5th: Aaron Kimberly D. Wendy Amy J.	Jr. High: Carol Marie Eric

# Sort the Standards

- Go to your Strand Poster
  - A: Inquiry Process (Strand 1)
  - B: Science in Personal & Social Perspectives (Strand 3)
  - © C: Life Science (Strand 4)
  - D: Earth and Space Science (Strand 6)
- Read your standards strips and tape them to the appropriate grade level. (K, 1, 2, 3, 4, 5, Jr. High)
  - Keep in mind that some grade levels might not teach all standards.

# Sort the Standards

- So, how did you do?
- OUse the Science Standards Articulated by Grade Level to check
  - Move any standards if you need to

- Walk around to each Strand Poster. Take special note of:
  - The grade level before you
  - Your grade level
  - The grade level after you

# Break into your GRADE LEVEL teams:

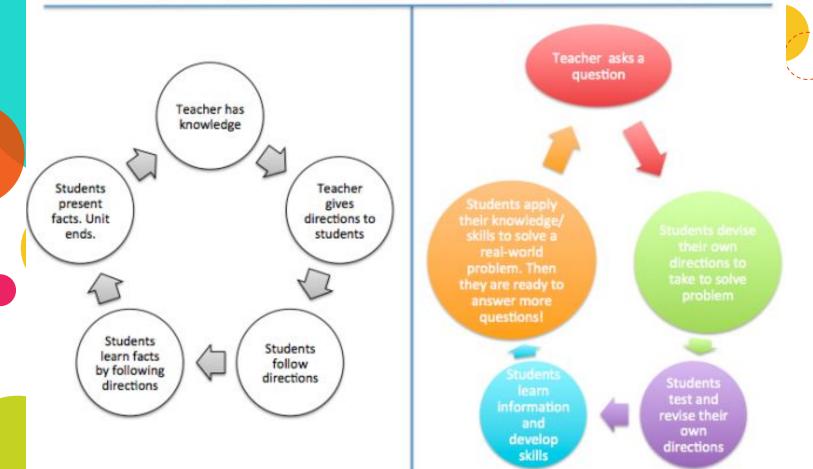
K: 5 senses Kimberly O. Margaret Laura Mary Angela Alexandra	1st: habitats Katy Brandie Cynthia	2nd: weather Rachel C. Clarissa Danielle Kelly Monica Sheri Valerie
3rd: diversity, adaptation Lynnda Mayme Carlynn Jennifer Brenda	4th: erosion Holly Deena	5th: skeleton  Aaron Kimberly D. Wendy Amy J. Cathleen Rachel H. Amy M.
		Jr. High: cells/osmosis Carol Marie Eric

# In your GRADE LEVEL teams:

- Look at the <u>Life and Earth Science</u> standards (strands 4 and 6) at your grade level.
- Stainstorm possible STEM units for your grade level:
  - Standards-driven instruction
  - Problem-based learning
  - Real-world connection
  - STEM template (August 12th/13th workshop)

### "Doing Projects"

# vs. Project-Based Learning



# Reflection: 3–2–1

- On the handout,
- Write 3 things you discovered this week
- Write 2 things you are going to implement in your classroom
- Write 1 question you still have



### August 12/13: Nature Center

© Engineering and STEM Lessons

### September 9/10: Game and Fish

PBL and Protecting Endangered Species

### October 14/15: NPC

Plant Diversity

### November: Frontier Room (Show Low)

Petrified Forest and Erosion

### <u>December 3: Webinar</u>

© Educational Technology

### January 13/14: NPC

O Population Analysis and Interpretation of Data

### February 4: Webinar

O Formative Assessments

### March 10/11: Frontier Room (Show Low)

O Presentations and DTAMS post-test

### On-going:

- Meeting with your grade level team to co-write a STEM unit.
- Integrating STEM into your classroom
- Videotape yourself teaching your STEM lesson
- Analyzing student work
- Observe teaching your STEM lesson (with Gail or Steve in

late February/March)

