



CCSS and New Arkansas Science Standards:

A Match Made in . . .

*What's the role of the Science and Engineering Practices?

*How do the SEP and CCSS support one another?

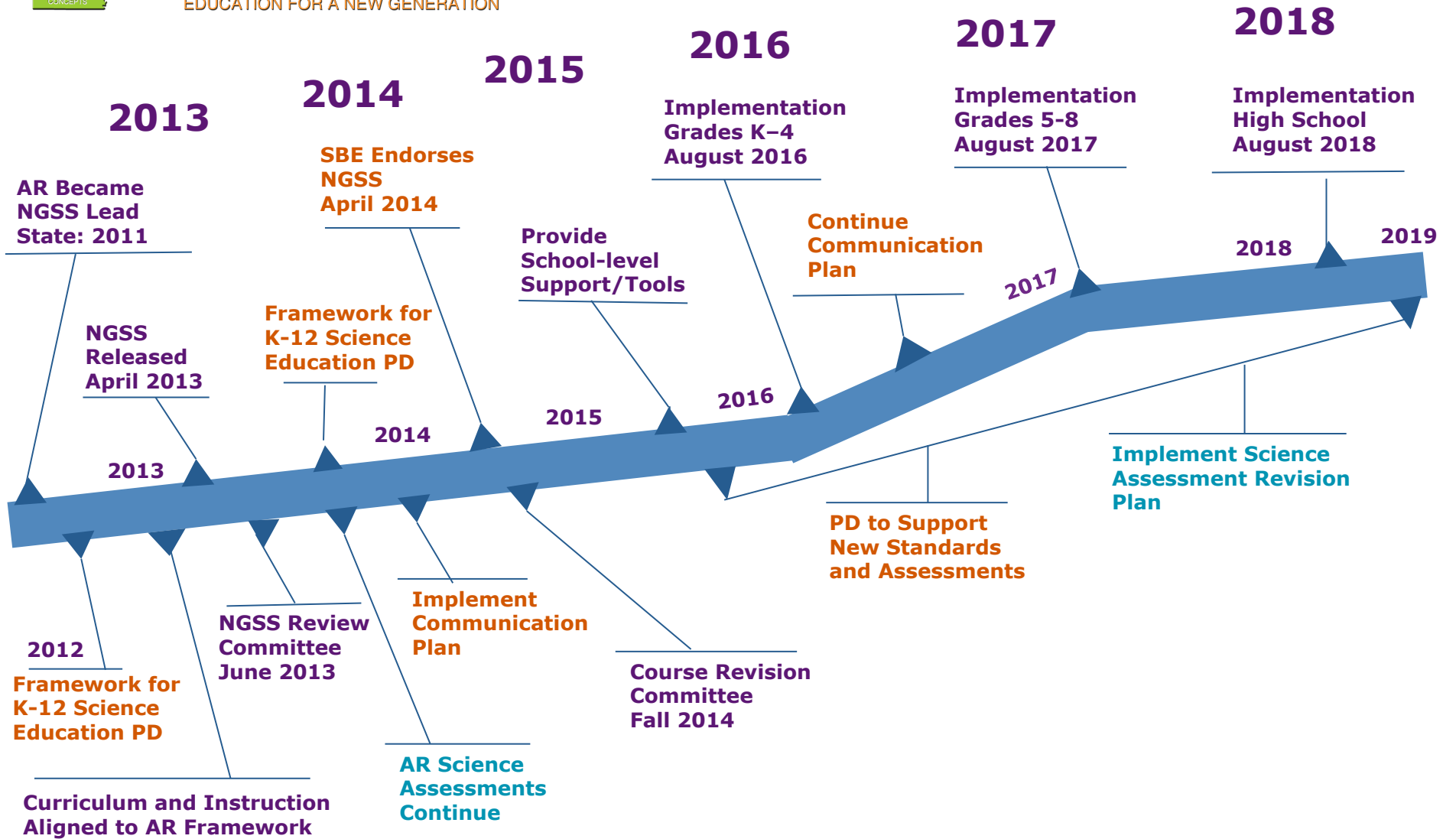
*Today's Topics



ARKANSAS K-12 SCIENCE STANDARDS

EDUCATION FOR A NEW GENERATION

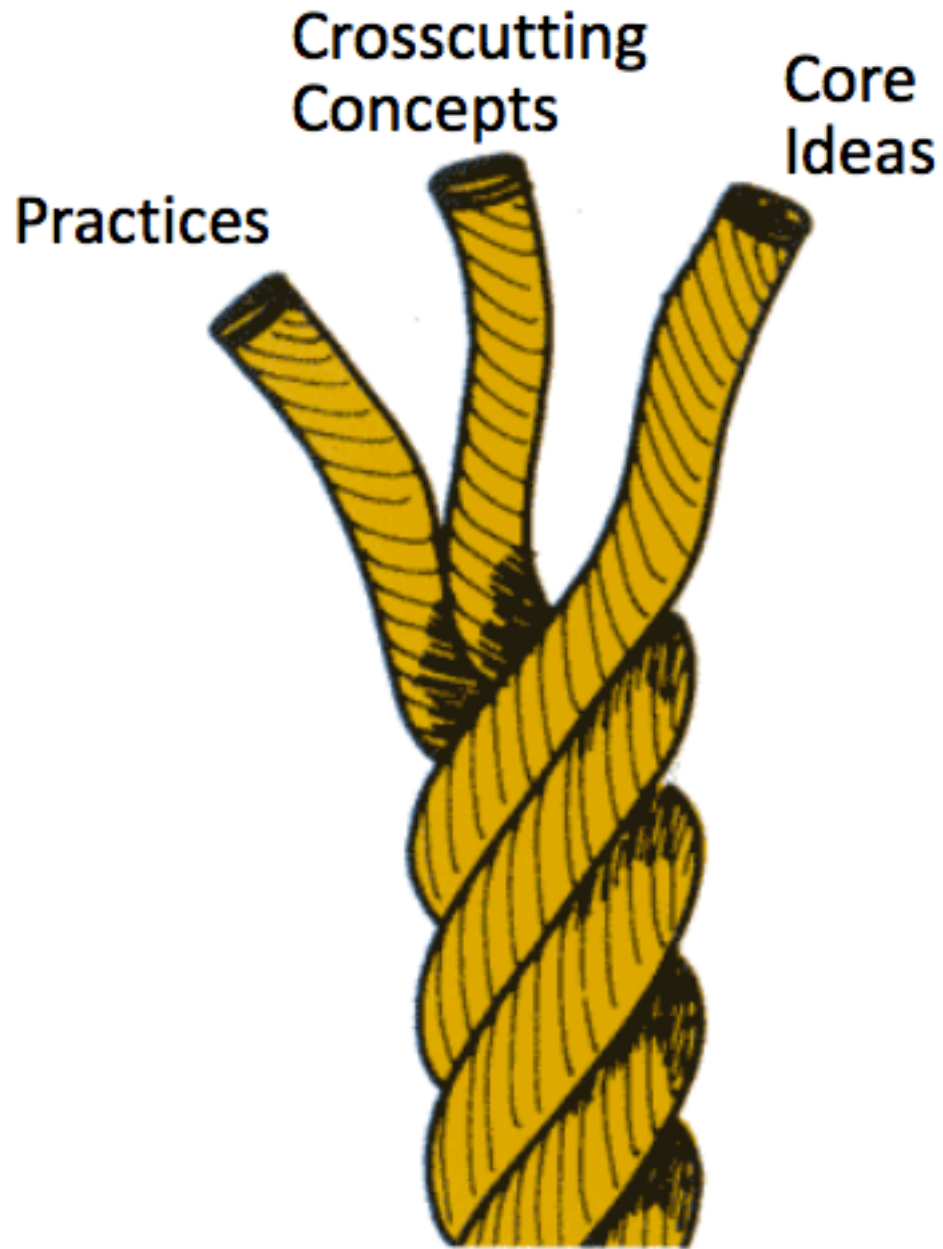
Science Standards Timeline



Curriculum and Instruction

Assessment

Professional Development



*What goes
into a
Performance
Expectation
aka
Standard?

NGSS Matrix Organized by Disciplinary Core Ideas

		Life Science	Earth & Space Science	Physical Science	Engineering
Elementary School	K	K-LS1 From Molecules to Organisms: Structures and Processes	K-ESS2 Earth's Systems K-ESS3 Earth and Human Activity	K-PS2 Motion and Stability: Forces and Interactions K-PS3 Energy	K-2-ETS1 Engineering Design
	1	1-LS1 From Molecules to Organisms: Structures and Processes 1-LS3 Heredity: Inheritance and Variation of Traits	1-ESS1 Earth's Place in the Universe	1-PS4 Waves and Their Applications in Technologies for Information Transfer	
	2	2-LS2 Ecosystems: Interactions, Energy, and Dynamics 2-LS4 Biological Evolution: Unity and Diversity	2-ESS1 Earth's Place in the Universe 2-ESS2 Earth's Systems	2-PS1 Matter and Its Interactions	
	3	3-LS1 From Molecules to Organisms: Structures and Processes 3-LS2 Ecosystems: Interactions, Energy, and Dynamics 3-LS3 Heredity: Inheritance and Variation of Traits 3-LS4 Biological Evolution: Unity and Diversity	3-ESS2 Earth's Systems 3-ESS3 Earth and Human Activity	3-PS2 Motion and Stability: Forces and Interactions	3-5-ETS1 Engineering Design
	4	4-LS1 From Molecules to Organisms: Structures and Processes	4-ESS1 Earth's Place in the Universe 4-ESS2 Earth's Systems 4-ESS3 Earth and Human Activity	4-PS3 Energy 4-PS4 Waves and Their Applications in Technologies for Information Transfer	
	5	5-LS1 From Molecules to Organisms: Structures and Processes 5-LS2 Ecosystems: Interactions, Energy, and Dynamics	5-ESS1 Earth's Place in the Universe 5-ESS2 Earth's Systems 5-ESS3 Earth and Human Activity	5-PS1 Matter and Its Interactions 5-PS2 Motion and Stability: Forces and Interactions 5-PS3 Energy	
Middle		MS-LS1 From Molecules to Organisms: Structures and Processes MS-LS2 Ecosystems: Interactions, Energy, and Dynamics MS-LS3 Heredity: Inheritance and Variation of Traits MS-LS4 Biological Evolution: Unity and Diversity	MS-ESS1 Earth's Place in the Universe MS-ESS2 Earth's Systems MS-ESS3 Earth and Human Activity	MS-PS1 Matter and Its Interactions MS-PS2 Motion and Stability: Forces and Interactions MS-PS3 Energy HS-PS4 Waves and Their Applications in Technologies for Information Transfer	MS-ETS1 Engineering Design
High School		HS-LS1 From Molecules to Organisms: Structures and Processes HS-LS2 Ecosystems: Interactions, Energy, and Dynamics HS-LS3 Heredity: Inheritance and Variation of Traits HS-LS4 Biological Evolution: Unity and Diversity	HS-ESS1 Earth's Place in the Universe HS-ESS2 Earth's Systems HS-ESS3 Earth and Human Activity	HS-PS1 Matter and Its Interactions HS-PS2 Motion and Stability: Forces and Interactions HS-PS3 Energy HS-PS4 Waves and Their Applications in Technologies for Information Transfer	HS-ETS1 Engineering Design

Eight Practices - Appendix F

- * Asking questions (science) and defining problems (engineering)
- * Design and using models
- * Planning and carrying out investigations
- * Analyzing and interpreting data
- * Using mathematics and computational thinking
- * Developing explanations (science) and designing solutions (engineering)
- * Engaging in argument
- * Obtaining, evaluating, and communicating information

The Practices are highly interconnected. They are not intended to be done in isolation from content.

Seven Crosscutting Concepts -Appendix G

1. Patterns
2. Cause and effect:
Mechanism and
explanation
3. Scale, proportion, and
quantity
4. Systems and system
models
5. Energy and matter:
Flows, cycles, and
conservation
6. Structure and function
7. Stability and change



Three-Dimensional Learning

- * Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem



Three-Dimensional Learning Dissected

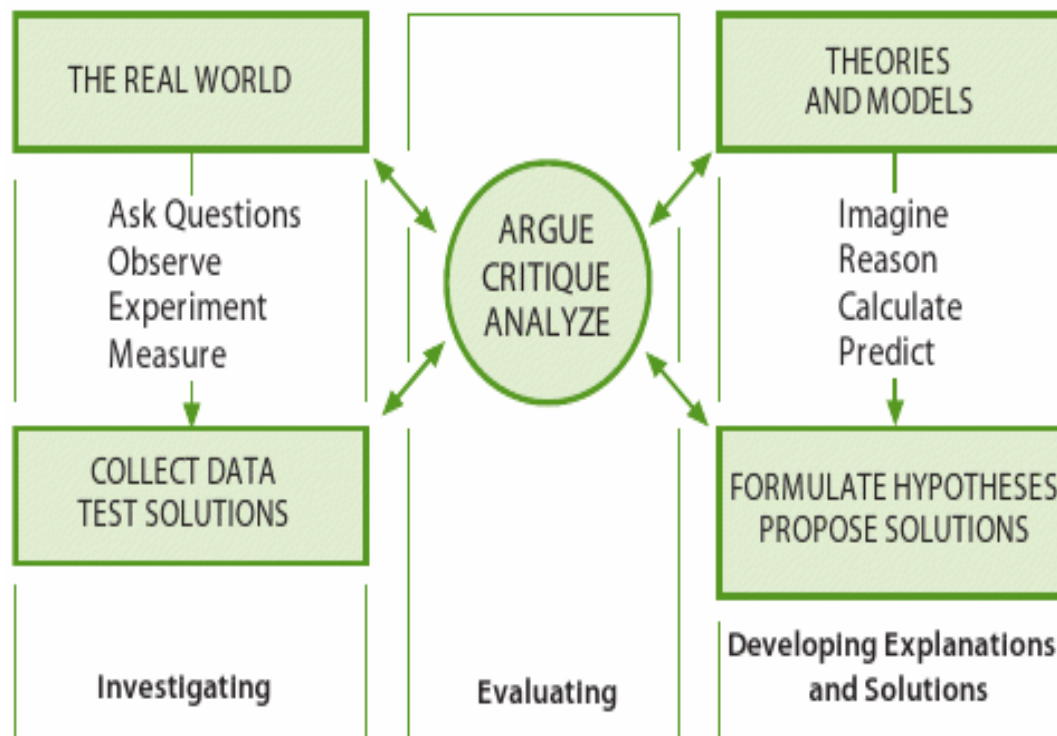
Analyze and interpret data to provide evidence for

the effects of

resource availability on organisms and populations of organisms in an ecosystem.



Three Spheres of Scientific and Engineering Activity



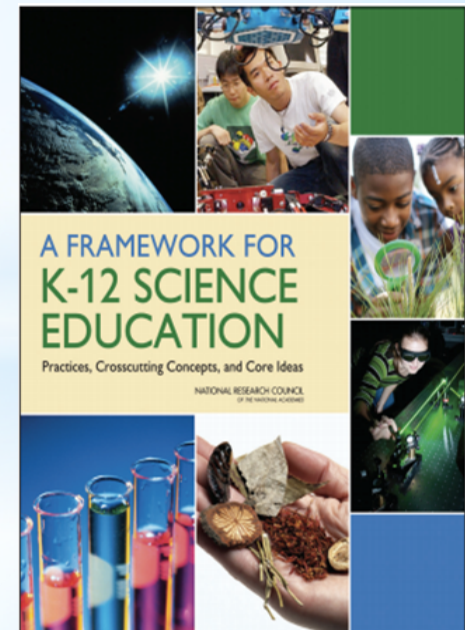
1. Read/Annotate Handout to self
 - a) ?s, I wonder why?
 - b) I noticed. . . I realized. . .
 - c) Ah-has
2. In groups
 - a) Explain the diagram to one another
3. Then, go paragraph by paragraph and share
 - a) ?s, I wonder why?
 - b) I noticed. . . I realized. . .
 - c) Ah-has

* Why are Science and Engineering Practices Essential?

- * Practices of science help students understand how scientific knowledge develops.
- * Practices of engineering help students understand the work of engineers & the links between engineering and science.
- * Participating in both practices helps students form an understanding of the crosscutting concepts and disciplinary ideas.
- * These can pique students' curiosity, capture their interest, and motivate their continued study.

Students, over multiple years of school, actively engage in scientific and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in these fields.

The Role of SEP and CCC . . .



- * Read the top paragraphs of the Progression
- * Read the bullets that go with your grade band.
- * Highlight/underline areas where there is overlap with CCSS.
- * Discuss: Any Ah-has? What might specific student work look like showing your students are engaged in these practices?
- * Complete the Practices Graphic Organizer
- * Be prepared to share out.

* Taking a Closer Look at Practices 6, 7, and 8

Constructing Explanations, Engaging in Argument from Evidence, and Obtaining Evaluating, and Communicating Information. . .

- How does these compare to your current teaching practice?
- What shifts will be necessary in your instruction or curriculum?
- What questions do you have?

Your Thoughts