Arizona Science Standards Revision Working Group

July 2, 2018

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Introductions

- Sarah Sleasman
  - Director of Science and STEM
- Brea Rivera
  - Science Specialist

- Jonathan Moore, Ed. D.
  - Deputy Associate Superintendent

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Arizona Science Standards Revision Working Group

Today we will…

- ❑ Address the K-12 progression of standards
- ❑ Look at the number of standards K-5 & HS (HS -- number of essential and plus)
- ❑ Look at the framework for any holes that could lead to a lack of scientific literacy
- ❑ Check and add grade level connections

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Housekeeping

1. Sign in
2. Parking validation
3. Restrooms
4. Breaks/Lunch
5. Travel Questions – Fill out W9 if needed
6. Sign forms – All members

Cell phones should only be used during breaks and lunch. If you need to take a call, please go to the break room. Please check text and email only during break due to non-disclosure.

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Housekeeping

Dr. Eugene Judson

Associate Professor - Science Education
Arizona State University

ASU Research project – IRB consent

Participation in this research project is completely voluntary and does not impact your participation in standards work.

Biggest Thank You!

Introductions

Introduce yourself by telling everyone in the group:

1. Your name
2. Your school/district
3. Your current position

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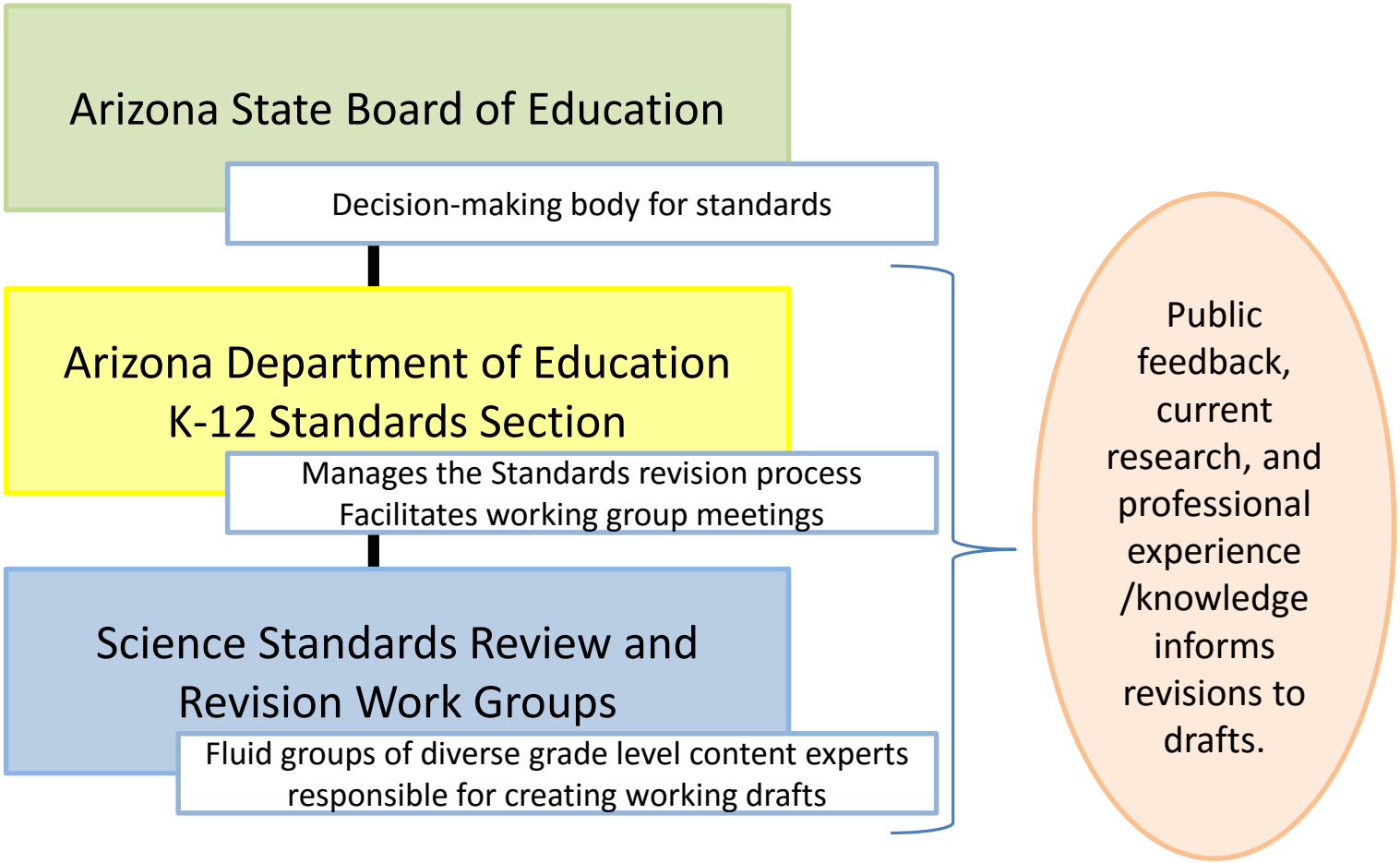
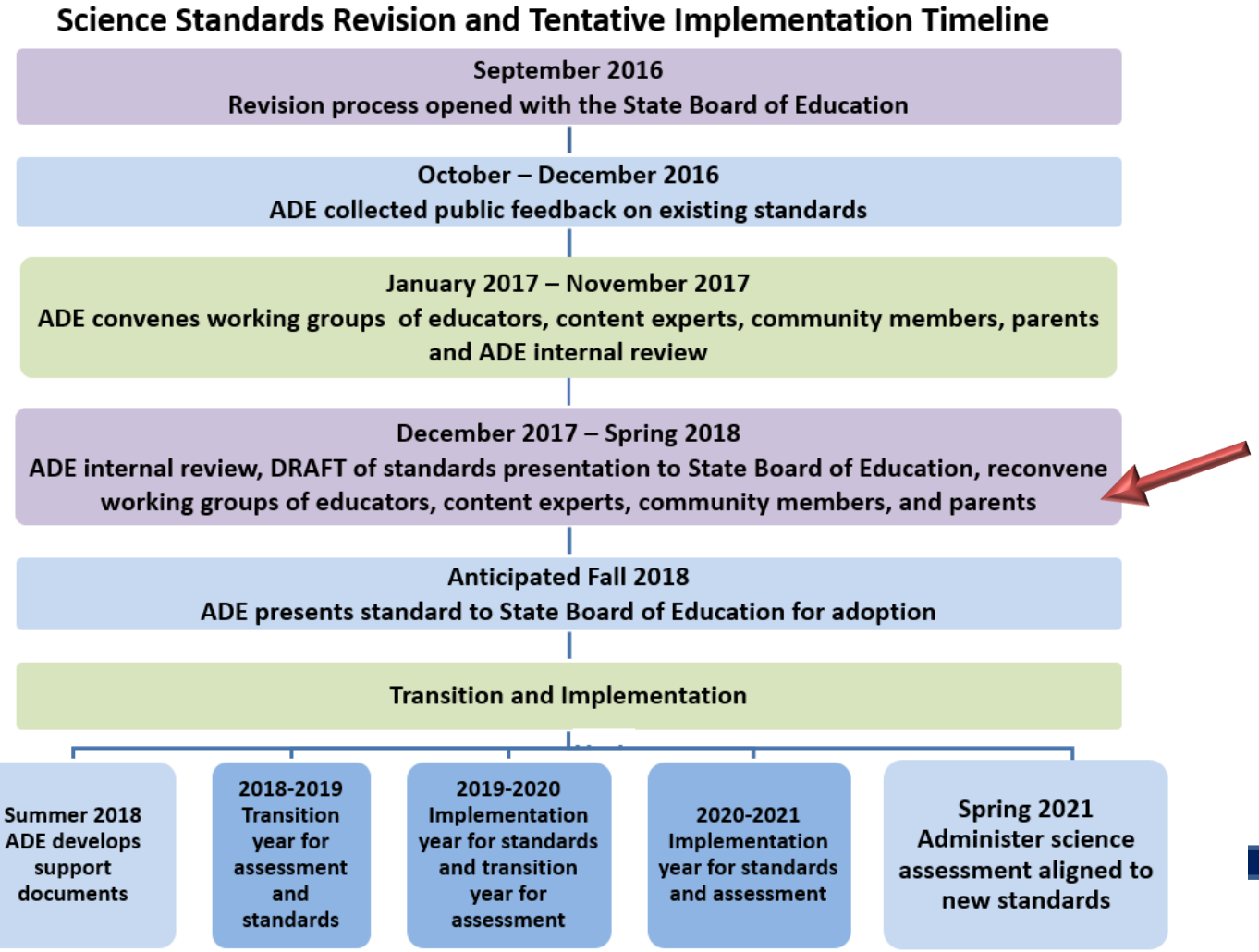
Standards Review - Structure



Science Standard Revision and Implementation Timeline



Working Group Norms

- Actively engage in all discussions
- Be open-minded
- Have an attitude that fosters collaboration, agreement, and consensus
- Be mindful of timelines and scope of work
- **Cell phone/email checks are limited to breaks**

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Standards, Curriculum, & Instruction

Standards – What a student needs to know, understand, and be able to do by the end of each grade. Standards build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels.

Standards are adopted at the state level by the State Board of Education.

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This is the "WHAT"

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Standards, Curriculum, & Instruction

Curriculum – The resources used for teaching and learning the standards. **Curricula are adopted at a local level by districts and schools**.

Instruction – The methods used by teachers to teach their students. **Instructional techniques are employed by individual teachers** in response to the needs of the students in their classes to help them progress through the curriculum in order to master the standards.

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This is the "HOW"

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Working Group Norms

No "I" Statements

Today's Tasks

Reminder:

Keep in mind our work product is public record.

Today's Tasks

Address the K-12 progression of standards

Distribution of the Grades 6-8 Standards

Dark blue = 6th Dark yellow = 7th Dark purple = 8th	**U1**: Science's purpose is to find the cause or causes of phenomena in the natural world.	**U2**: Scientific explanations, theories, and models are those that best fit the evidence available at a particular time.	**U3**: The knowledge produced by science is used in engineering and technologies to create products.	**U4**: Applications of science often have both positive and negative ethical, social, economic, and political implications.
P1: All matter in the Universe is made of very small particles.	6.P1U1.1 6.P1U1.2	6.P1U2.3 8.P1U2.1	8.P1U3.2	
P2: Objects can affect other objects at a distance.	7.P2U1.1	7.P2U2.2		
P3: Changing the movement of an object requires a net force to be acting on it.		6.P3U2.4 7.P3U2.3		
P4: The total amount of energy in a closed system is always the same but can be transferred from one energy store to another during an event.	8.P4U1.3 8.P4U1.4		6.P4U3.5 8.P4U3.5	
E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.	6.E1U1.6 8.E1U1.6	7.E1U2.4 7.E1U2.5	7.E1U3.6 8.E1U3.7	8.E1U4.8
E2: The Earth and our Solar System are a very small part of one of many galaxies within the Universe.	6.E2U1.7 6.E2U1.8 6.E2U1.12	6.E2U2.9 6.E2U2.11	6.E2U3.10	
L1: Organisms are organized on a cellular basis and have a finite life span.	6.L1U1.14 7.L1U1.7	6.L1U2.13 6.L1U2.15	7.L1U3.8	
L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.	6.L2U1.16	7.L2U2.9 7.L2U2.10		7.L2U4.11
L3: Genetic information is passed down from one generation of organisms to another.	8.L3U1.9			8.L3U4.10
L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.		8.L4U2.11 8.L4U2.12		

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Today's Tasks

Look at the number of standards

HS -- number of essential and plus

Grade	Physical Standards	Earth & Space Standards	Life Standards	U1	U2	U3	U4	Total # of Standards 2018	Total # of PO's 2004
6th Grade	P1 - 3 P2 - 0 P3 - 1 P4 - 1	E1 – 1 E2 – 6	L1- 3 L2 – 1 L3 – 0 L4 - 0	6.P1U1.1 6.P1U1.2 6.E1U1.6 6.E2U1.7 6.E2U1.8 6.E2U1.12 6.L1U1.14 6.L2U1.16	6.P1U2.3 6.P3U2.4 6.E2U2.9 6.E2U2.11 6.L1U2.13 6.L1U2.15	6.P4U3.5 6.E2U3.10		Total: 16 P: 5 E: 7 L: 4	24 4 11 9
7th Grade	P1 - 0 P2 - 2 P3 - 1 P4 - 0	E1 – 3 E2 – 0	L1- 2 L2 – 3 L3 – 0 L4 - 0	7.P2U1.1 7.L1U1.7	7.P2U2.2 7.E1U2.4 7.E1U2.5 7.L2U2.9 7.L2U2.10	7.E1U3.6 7.E1U3.6 7.L1U3.8	7.L2U4.11	Total: 11 P: 3 E: 3 L: 5	22 0 16 6
8th Grade	P1 - 2 P2 - 0 P3 - 0 P4 -3	E1 – 3 E2 – 0	L1- 0 L2 – 0 L3 – 2 L4 -2	8.P4U1.3 8.P4U1.4 8.E1U1.6 8.L3U1.9	8.L4U2.11 8.L4U2.12	8.E1U3.7	8.E1U4.8 8.L3U4.10	Total: 12 P: 5 E: 3 L: 4	21 12 0 9

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Today's Tasks

Look at the framework for any holes that could lead to a lack of scientific literacy…

	causes of phenomena in the natural world.	and models are those that best fit the evidence available at a particular time.	used in engineering and technologies to create products.	both positive and negative ethical, social, economic, and political implications.
P1: All matter in the Universe is made of very small particles.		2.P1U2.1 2.P1U2.2		
P2: Objects can affect other objects at a distance.	1.P2U1.1	K.P2U2.1 1.P2U2.2	K.P2U3.2	
P3: Changing the movement of an object requires a net force to be acting on it.	1.P3U1.3			
P4: The total amount of energy in a closed system is always the same but can be transferred from one energy store to another during an event.	2.P4U1.3		1.P4U3.4	
E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.	K.E1U1.3 K.E1U1.4 1.E1U1.5 2.E1U1.4	2.E1U2.5	2.E1U3.6	2.E1U4.7
E2: The Earth and our Solar System are a very small part of one of many galaxies within the Universe.	2.E2U1.8			
L1: Organisms are organized on a cellular basis and have a finite life span.	K.L1U1.5 1.L1U1.6			
L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.	1.L2U1.8 2.L2U1.9 2.L2U1.10	K.L2U2.6 1.L2U2.7		
L3: Genetic information is passed down from one generation of organisms to another.		1.L3U2.9		
L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.		K.L4U2.7 1.L4U2.10		1.L4U4.11

Today's Tasks

Look at the standard for scientific accuracy and fine tune wording…

2.E1U3.6	
Analyze patterns in weather conditions of various regions of the world and **design, test, and refine solutions** to protect humans from severe weather conditions. Concepts first taught in K.E1U1.3, K.E1U1.4	**Weather** is the combination of **sunlight**, **wind**, **snow** or **rain**, and **temperature** in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.[4] Crosscutting Concepts: **energy and matter**, **systems and system models**, patterns, cause and effect, stability and change[4]
2.E1U4.7	
Construct an argument from evidence regarding positive or negative changes in water and land systems that impact humans and the environment.	Plants and animals (including humans) depend on the land, water, and air to live and grow. They in turn can change their environment (e.g., the shape of land, the flow of water). [4] Crosscutting Concepts: **energy and matter**, **systems and system models**, patterns, cause and effect, stability and change[4]

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Today's Tasks

If time…The Storylines

Storyline

- Add in mention of the metric system
- Revise storyline to match standards in that grade level

Final Thoughts

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Final Thoughts

Standards Revision Executive Summary

Grade Level	Key Highlights from Public Comment and/or Technical Review	Key Points of Discussion from Working Group	Key Revisions and/or Changes
Kindergarten			
First Grade			
Second Grade			
Third Grade			
Fourth Grade			
Fifth			
Sixth			

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