

Arizona Science Standards Revision Working Group



June 28, 2017

Housekeeping

1. Sign in
2. Parking validation
3. Restrooms
4. Breaks/Lunch
6. Travel Questions – Fill out W9 if needed
7. Sign non-disclosure form – 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.

Biggest Thank You!

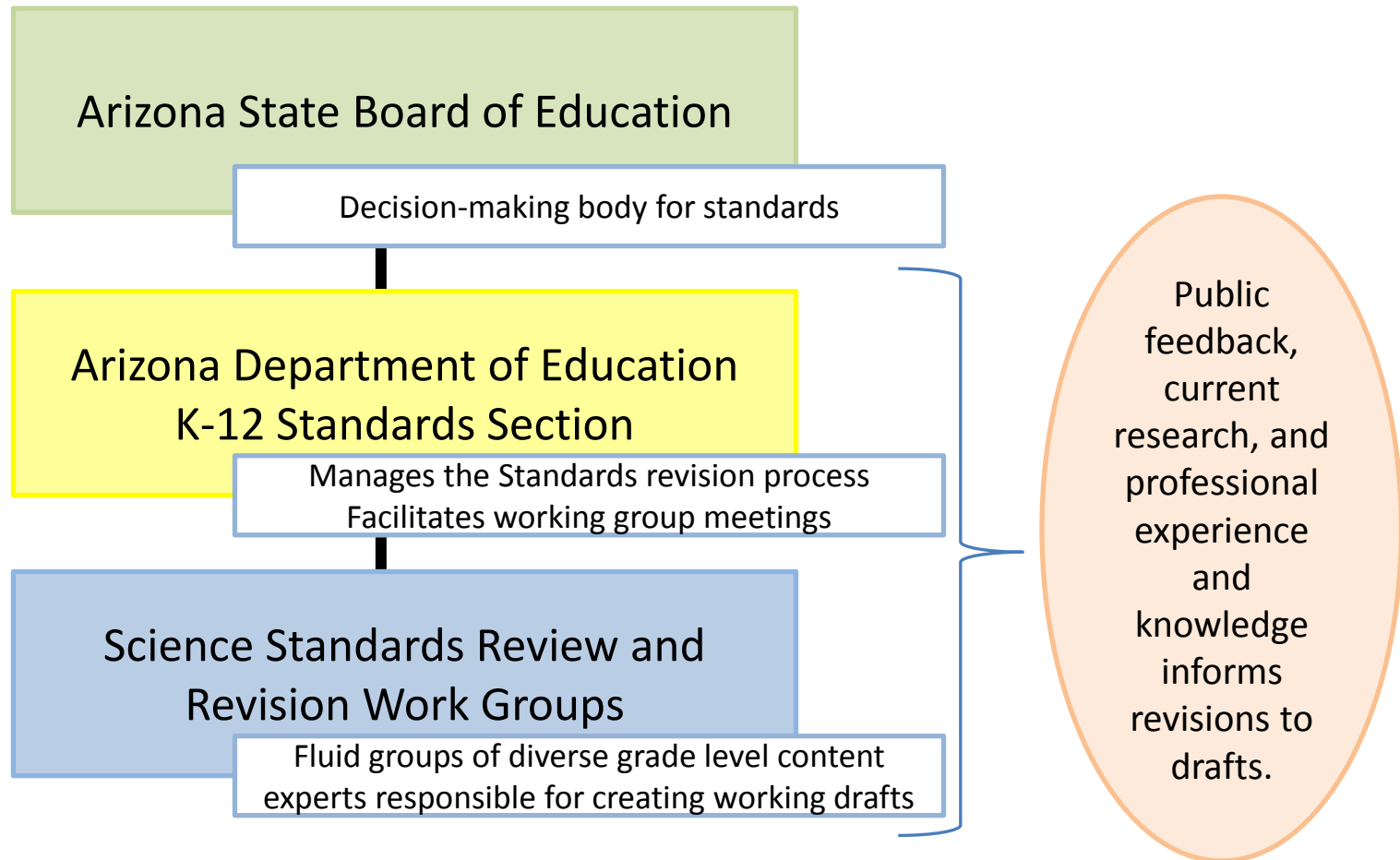


Introductions

Introduce yourself by telling everyone in the group:

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

Standards Review - Structure



Roles/Responsibilities: ADE K-12 Standards Staff

ADE K-12 Standards Members

- Facilitate work group meetings
- Provide meeting goals, agendas, tasks, and instructions
- Provide needed materials
- Organize committee members into vertical, horizontal, and/or content groups, as appropriate.

Roles/Responsibilities: Working Groups

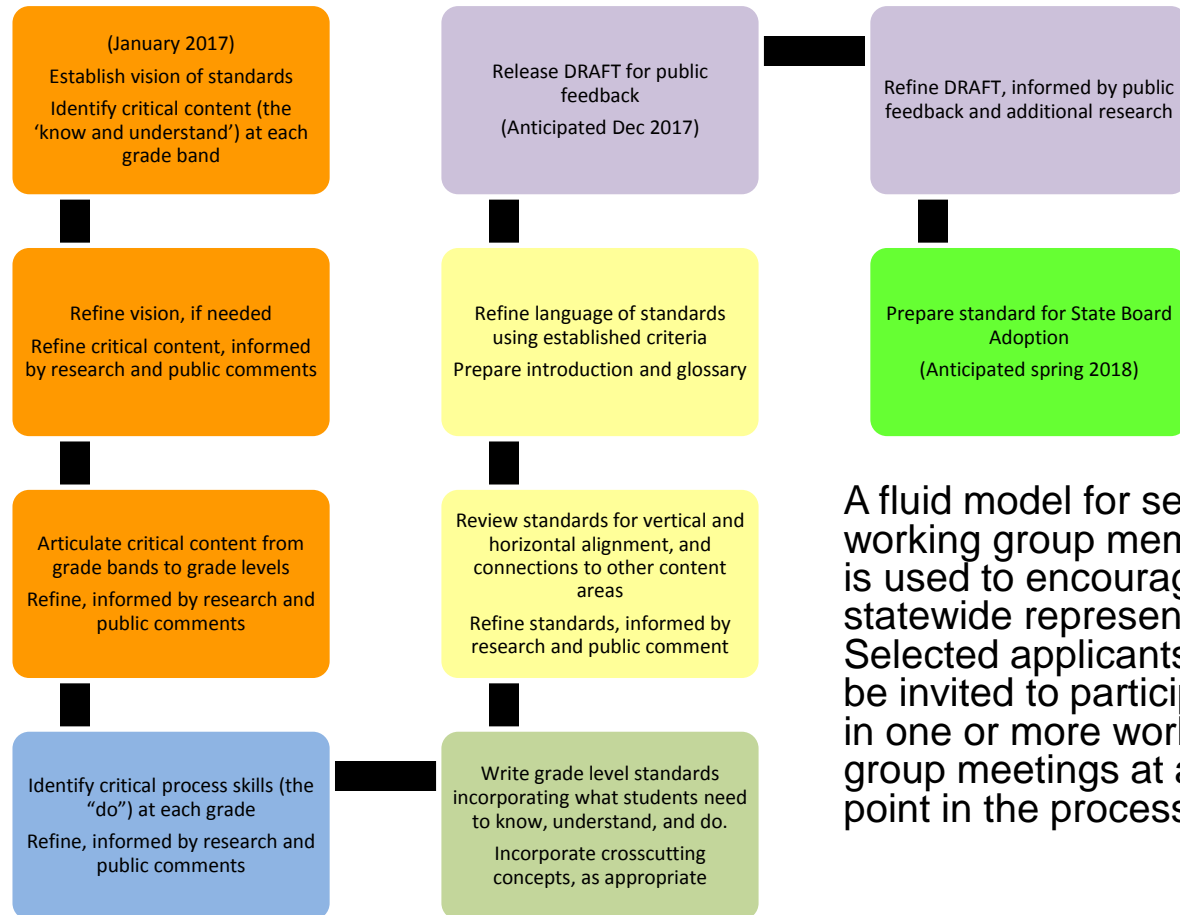
- 1. Develop the vision for the revised Science Standards**
- 2. Develop drafts of K-12 Science Standards**
 - Make decisions about content and structure of grade level standards
 - Apply content knowledge, grade-level expertise, research, and public feedback to inform all decisions
- 3. Develop drafts of the introduction, glossary, and other appendices, as needed for the K-12 Science Standards**

Structure: Working Groups

Use a fluid membership model (“accordion model”) to include multiple voices and perspectives throughout the process

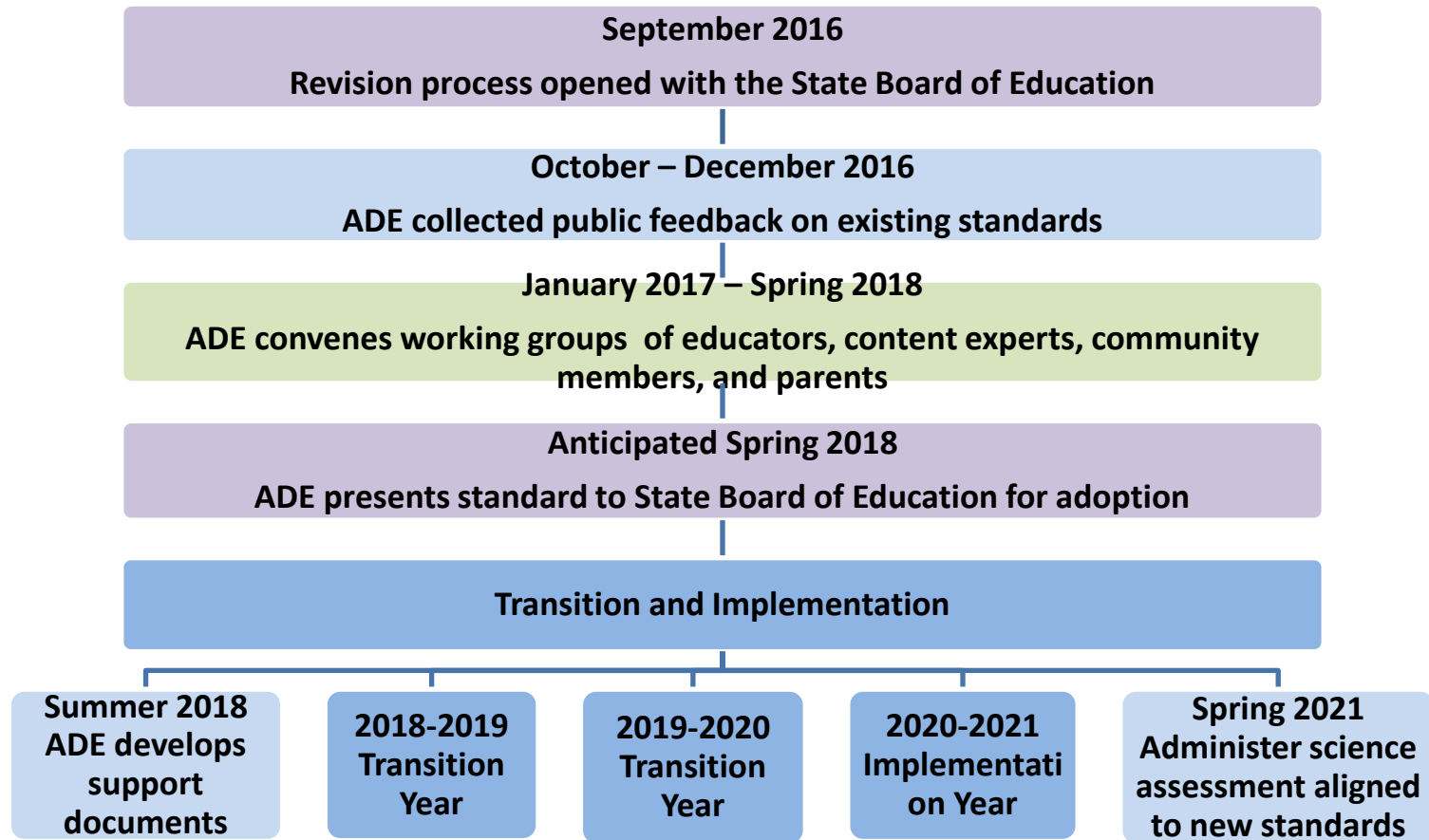
- K-12 teachers, coaches, curriculum directors, administrators
- Higher education: science education and science content instructors, professors, and/or researchers
- Content experts from the community
- Parents

Standards Review - Structure



A fluid model for selecting working group members is used to encourage statewide representation. Selected applicants may be invited to participate in one or more working group meetings at any point in the process.

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 (non-disclosure)**

Questions on Structure



ADE Directive for the Science Standards

- Arizona standards, written for Arizona teachers and students, by Arizona educators and content experts
- Write grade-level standards and not performance objectives

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.



This is the “WHAT”



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.

Standards versus Performance Objectives

Content Standards

Standards are what students need to know, understand, and be able to do **by** the end of each grade level. Standards build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels.

Performance Objectives

Performance Objectives are **incremental steps** toward mastery of individual content standards. Performance Objectives are knowledge and skills that a student must demonstrate at each grade level. Performance objectives do not imply a progression of learning and, because they are discrete skills, reach a limited level of cognitive demand.

Work to Date:

- Developed a working vision to guide all future science standards work
- Identified critical content for each grade



Work to Date:

Last Meeting

- Articulated critical content from grade bands to grade levels.
- Refined critical content/progressions based on public feedback, research, and expertise.



Recommendation 11: Any assumptions about the resources, time, and teacher expertise needed for students to achieve particular standards should be made explicit.

In designing the framework, **the committee tried to set goals** for science education that would not only improve its quality but also **be attainable under current resources and other constraints**. In addition, the committee intended for the framework's goals to act as levers for much-needed improvement in how schools are able to deliver high-quality science education to all students. For example, **in order to meet the goals for science education in the elementary grades, more time may need to be devoted to science than is currently allocated**. The committee recognizes as well that new curricula aligned to the framework will need to be developed and that professional development for teachers will need to be updated.

A Framework for K-12 Science Education (page 305)

Standards Design: Time Expectations



Reach Committee Decision

1. Anticipated amount of instructional time needed to teach new science standards
2. Resources to consider:
 - [ADE Recommended Instructional Time](#)
 - [MA STE Standards](#) (p. 14)

Refine Articulation to Grade Level



Review Articulation from Last Meeting:

Returning members update new members

Used Grade Level Charts

1. Reviewed Working Group Agreements
2. Copied critical content from the first column (grade band) into the appropriate grade level column(s).
3. Refined critical content on the grade level charts.

Based decisions on research, other states' standards, public feedback, and expertise.

Recommendation 10: If grade-by-grade standards are written based on the grade band descriptions provided in the framework, these standards should be designed to provide a coherent progression within each grade band.

The content described in the framework is designed to be distributed over each grade band in a manner that builds on previous learning and is not repetitive. If standards developers choose to create grade-by-grade standards, it is necessary that these standards provide clear articulation of the content across grades within a band and attend to the progression of science learning from grade to grade within the band.

[A Framework for K-12 Science Education](#) (page 305)

- **Recommendation 1: Standards should set rigorous learning goals that represent a common expectation for all students.**
- Recommendation 2: Standards should be scientifically accurate yet also clear, concise, and comprehensible to science educators.
- **Recommendation 3: Standards should be limited in number.**
- Recommendation 4: Standards should emphasize all three dimensions articulated in the framework—not only crosscutting concepts and disciplinary core ideas but also scientific and engineering practices.






[A Framework for K-12 Science Education](#) (pages 298-300)



Refine Articulation to Grade Level

Form 3 vertical groups,
with representation
from each grade band.

- Review and refine articulation for each progression.
- Map each progression using Big Ideas cards.

K	1st	2nd	3rd	4th
				
				
				
				
				

Refine Articulation to Grade Level

Considerations as you review grade level progressions for each big idea.

- Reasonable for instructional time
 - Depth vs breadth
 - Content + practices
- Pre- or Co-requisite concepts
- Coherence of progression
 - Gaps and/or redundancies

K	1st	2nd	3rd	4th

Validate with public feedback, research, and your expertise.

Articulation Considerations

- Each group presents articulation map
- Whole group discussion and consensus building
- Select (or refine) a single articulation map to move the work forward

