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.*
“If we teach today’s student as we taught yesterday’s, we rob them of tomorrow”

John Dewey, 1915
Introductions

Introduce yourself by telling everyone in the group:

1. Your name
2. Your school/district
3. Your current position
Standards Review - Structure

Arizona State Board of Education
- Decision-making body for standards

Arizona Department of Education K-12 Standards Section
- Manages the Standards revision process
- Facilitates working group meetings

Science Standards Review and Revision Work Groups
- Fluid groups of diverse grade level content experts responsible for creating working drafts

Public feedback, current research, and professional experience and knowledge informs revisions to drafts.
Science Standard Revision and Implementation Timeline

September 2016
Revision process opened with the State Board of Education

October – December 2016
ADE collected public feedback on existing standards

January 2017 – Spring 2018
ADE convenes working groups of educators, content experts, community members, and parents

Anticipated Spring 2018
ADE presents standard to State Board of Education for adoption

Transition and Implementation

Summer 2018
ADE develops support documents

2018-2019 Transition Year

2019-2020 Transition Year

2020-2021 Implementation Year

Spring 2021
Administer science assessment aligned to new standards
Standards Review - Structure

(January 2017)
Establish vision of standards
Identify critical content (the "know and understand") at each grade band

Refine vision, if needed
Refine critical content, informed by research and public comments

Articulate critical content from grade bands to grade levels
Refine, informed by research and public comments

Identify critical process skills (the “do”) at each grade
Refine, informed by research and public comments

Release DRAFT for public feedback
(Anticipated Dec 2017)

Refine language of standards using established criteria
Prepare introduction and glossary

Refine standards for vertical and horizontal alignment, and connections to other content areas
Refine standards, informed by research and public comments

Write grade level standards incorporating what students need to know, understand, and do.
Incorporate crosscutting concepts, as appropriate

Refine DRAFT, informed by public feedback and additional research

Prepare standard for State Board Adoption
(Anticipated spring 2018)

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.
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
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
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 – 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.
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 band/big idea
Discuss Critical Content

In grade bands, review critical content work from last meeting

- Returning members update new members
Break into content area groups (Life, Earth, Physical, NOS) with representation from each grade band.

- Review public feedback for each progression.
- Refine critical content/progressions based on public feedback, research, and expertise.
# A Framework for K-12 Science Education

## Science and Engineering Practices
1. Asking questions and defining problems
2. Developing and Using Models
3. Planning and Carrying Out Investigations
4. Analyzing and Interpreting Data
5. Using Mathematics and Computational Thinking
6. Constructing Explanations and Designing Solutions
7. Engaging in Argument from Evidence
8. Obtaining, Evaluating, and Communicating Information
A Framework for K-12 Science Education

Cross-cutting Concepts

1. Patterns
2. Cause and effect
3. Structure and Function
4. Energy and Matter
5. Systems and System Models
6. Scale, Proportion and Quantity
7. Stability and Change
Form new groups.

Discuss:
As we articulate grade band content by grade level, what is the role of

• crosscutting concepts?
• science and engineering practices?
Articulation Considerations

• Each group presents thoughts
• Whole group discussion and consensus building