

Computer Science Standards Revision



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Superintendent of Public Instruction

Working Group Meeting

April 10, 2018

K-12 Academic Standards

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.

“Details create the big
picture.”

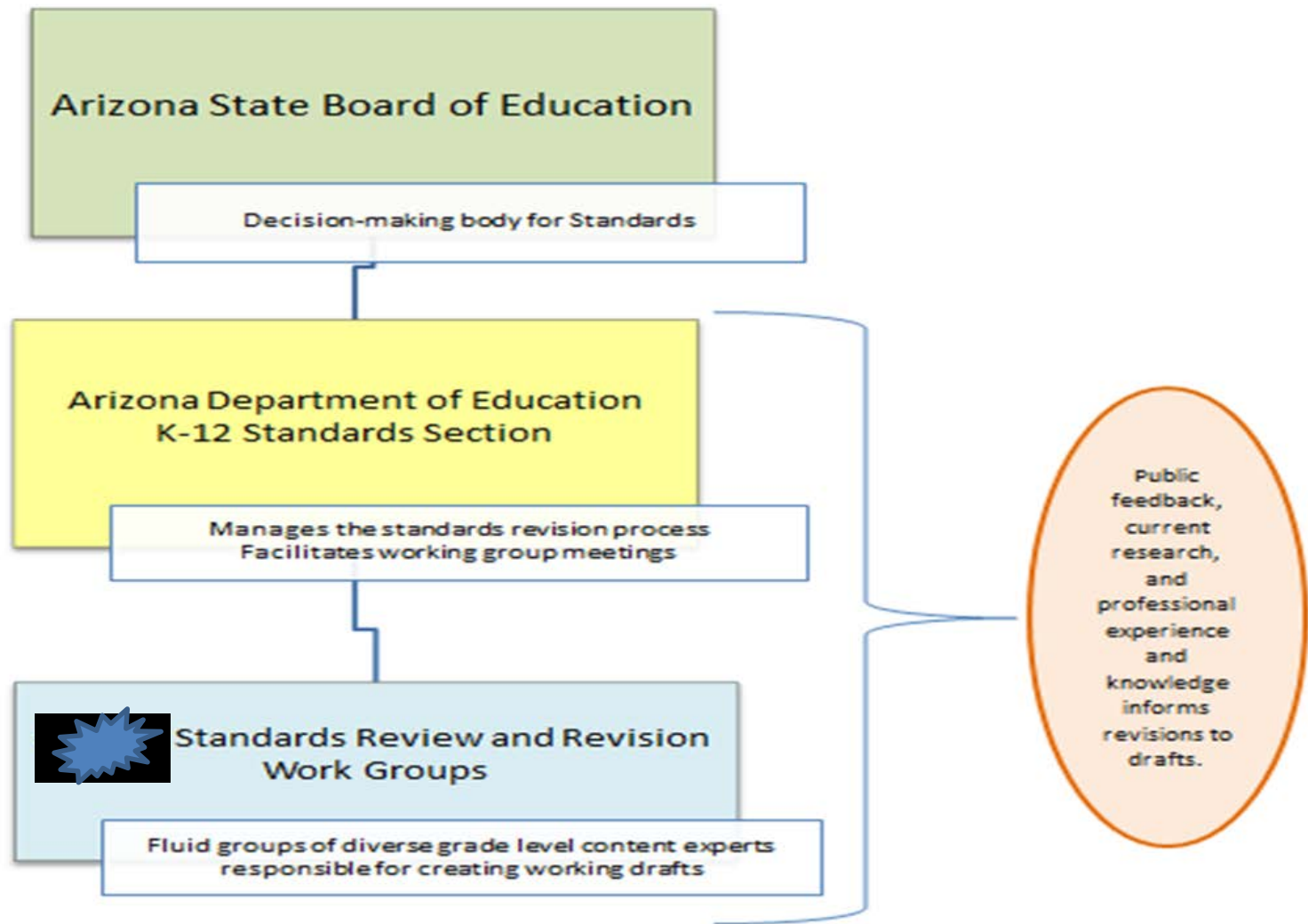
—Stanford Weill

Introductions

Introduce yourself by telling everyone in the group:

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

Standards Review- Structure



Governor's Office of Education

- Governor's Office of Education was appropriated \$200,000 to support the development of computer science standards for K-12.
- K-12 Academic Standards, in collaboration with the Governor's office, will convene educators, content experts, and other stakeholders to develop standards.



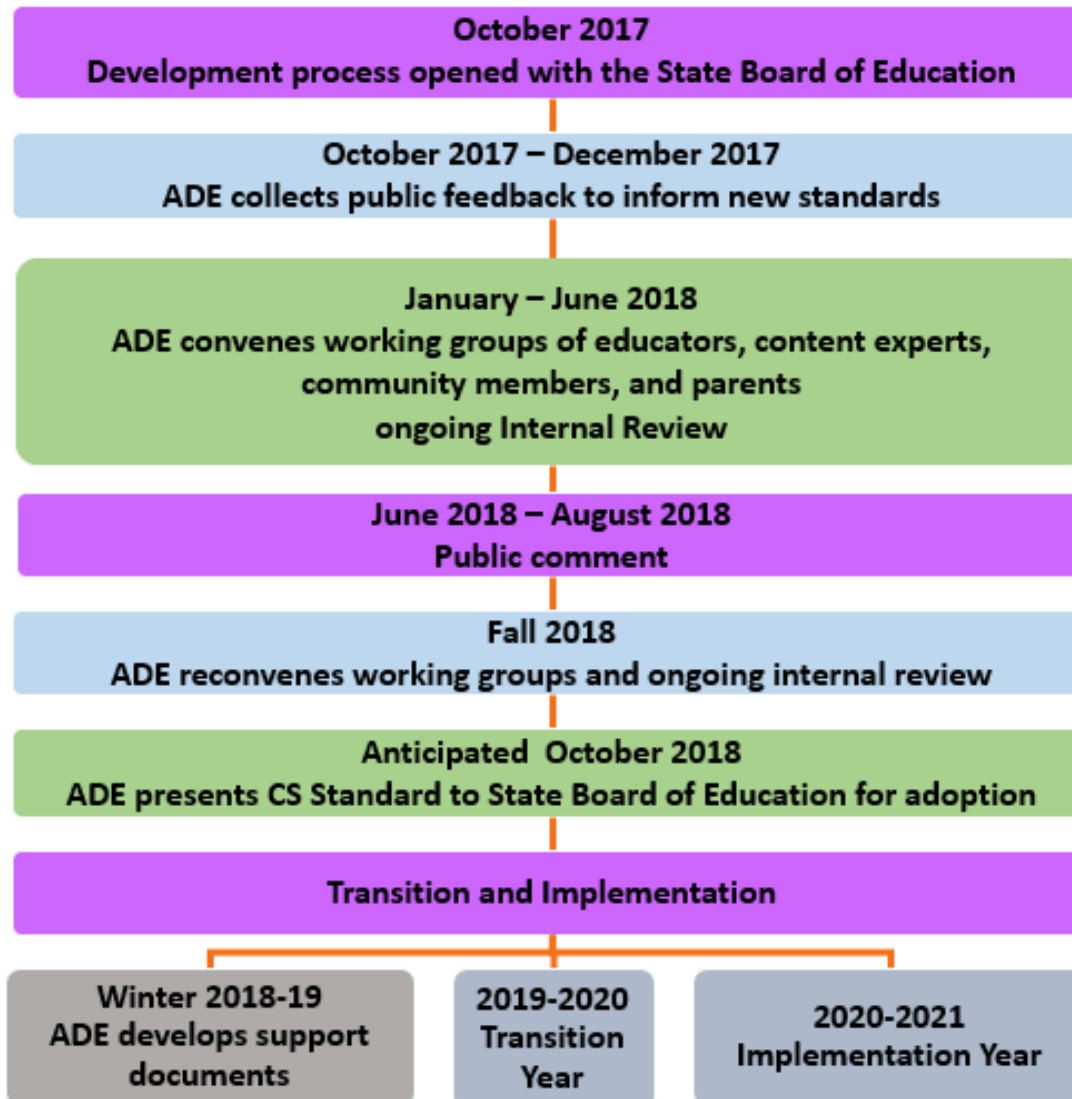
Roles/Responsibilities: ADE K-12 Standards Staff

ADE K-12 Standards Members

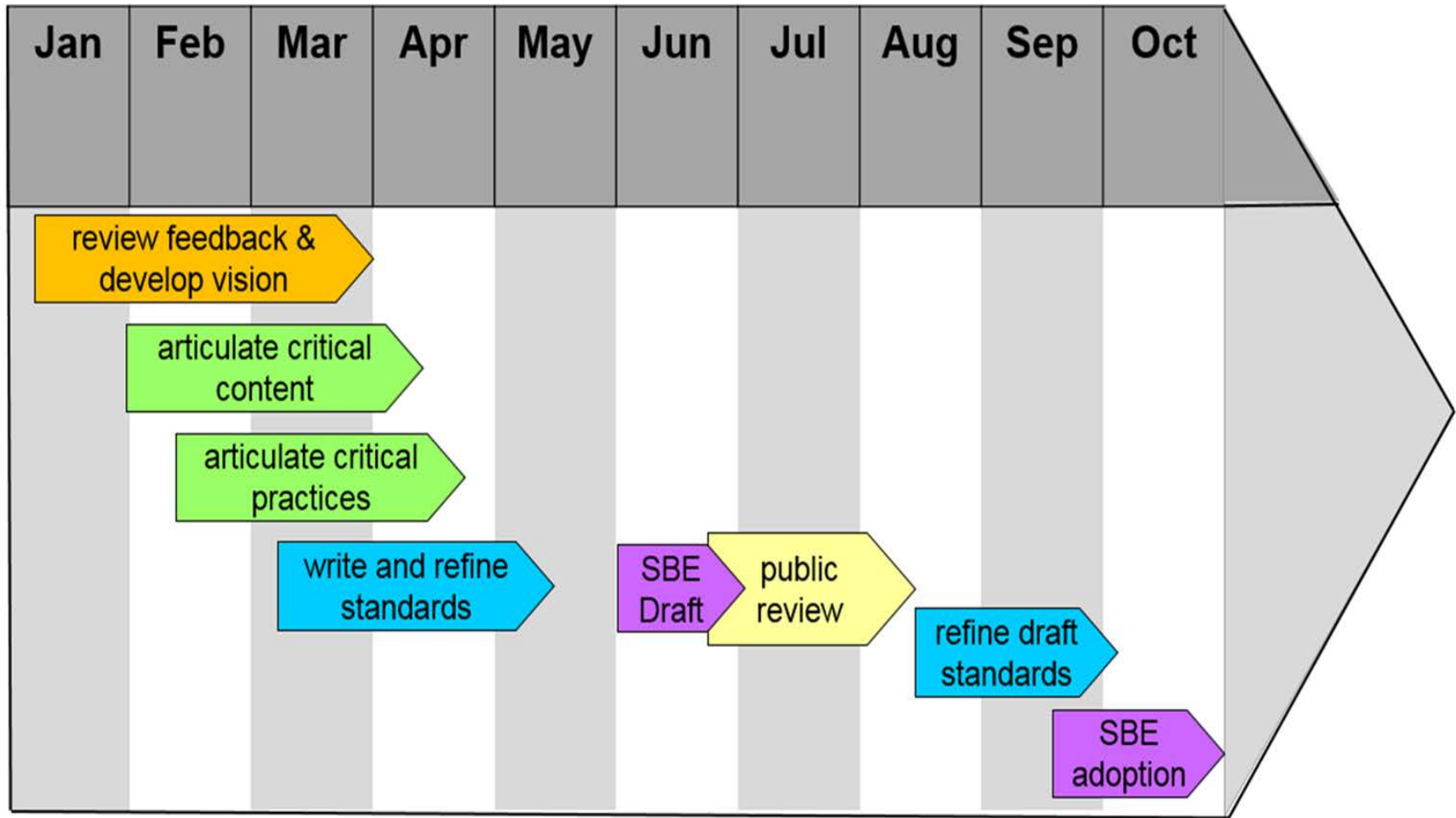
- Facilitate work group meetings
- Provide meeting goals, agendas, tasks, and instructions
- Provide needed materials
- Organize committee members into vertical, horizontal, and/or content groups, as appropriate.



CS Standards Development and Implementation Timeline



CS Standards Development Outline



*ongoing internal review

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: computer science education and computer science content instructors, professors, and/or researchers
- Content experts from the community
- Parents



Roles/Responsibilities: Working Groups

1. ~~Develop the vision for the Computer Science Standards~~ **DONE**
2. **Write the Computer 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 K-12 Computer Science Standards, including an introduction, glossary, and other appendices, as needed**

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 Mission for Computer 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 increasing 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 the standards. 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

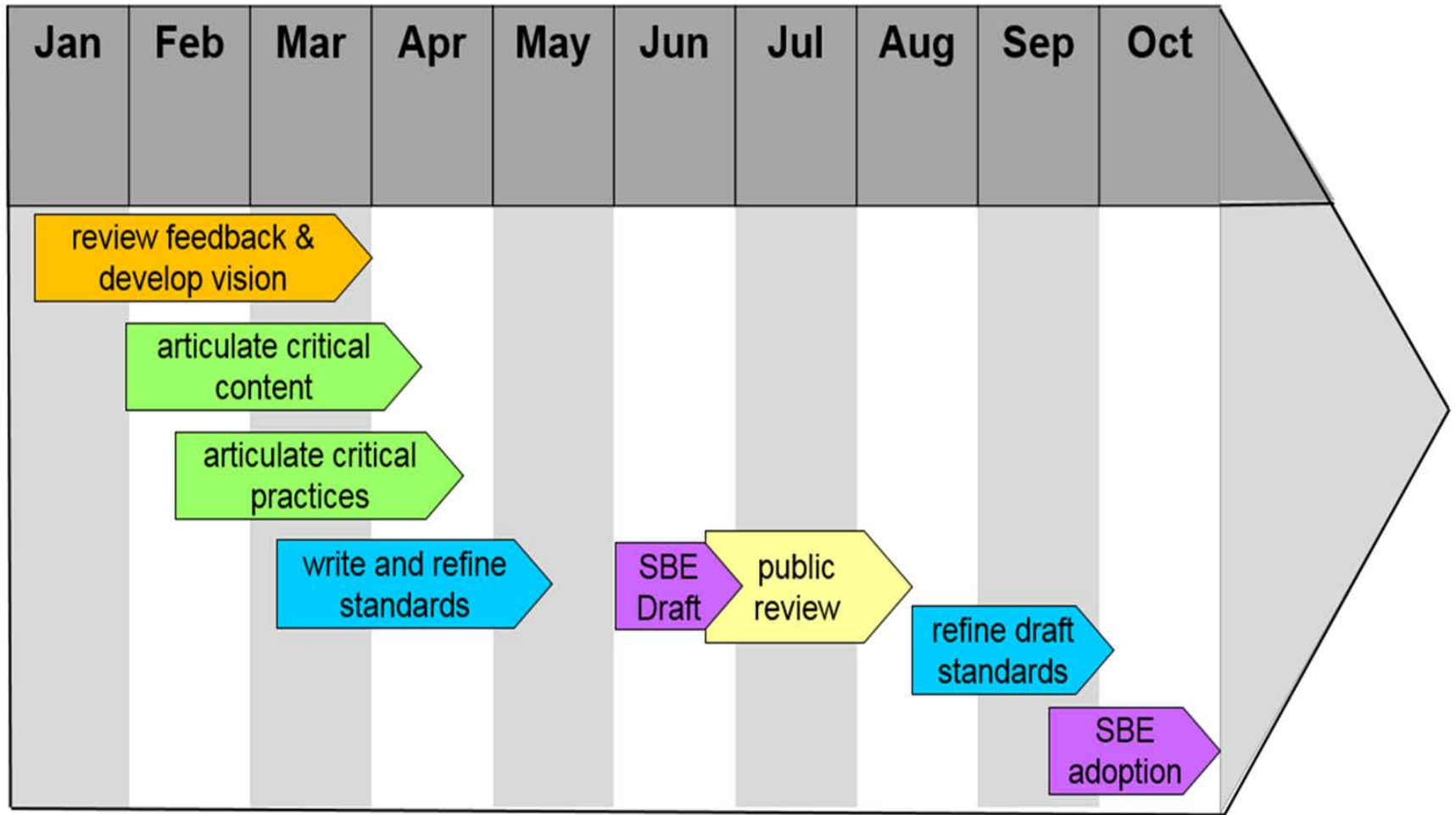
Content Standards

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.

CS Standards Development Outline



*ongoing internal review

Computer Science Core Concepts and Practices

Core Concepts and Practices

Core Practices

1. Fostering an Inclusive Computing Culture
2. Collaborating Around Computing
3. Recognizing and Defining Computational Problems
4. Developing and Using Abstractions
5. Creating Computational Artifacts
6. Testing and Refining Computational Artifacts
7. Communicating About Computing

Core Concepts

1. Computing Systems
2. Networks and the Internet
3. Data and Analysis
4. Algorithms and Programming
5. Impacts of Computing

Crosscutting Concepts

1. Abstraction
2. System Relationships
3. Human-Computer Interaction
4. Privacy and Security
5. Communication and Coordination

AZ CS Standards Creation

- In small groups, provide input on proposed AZ CS Standards
- Use CSTA and NV standards as a baseline to build from
- Build from overarching concept, through the more focused sub-concept, to the pinpoint standard
- Work sequentially through the 2nd and 3rd core practices. NOTE: there will be 2 more workgroup sessions after this one.



AZ CS Standards Exemplar

Arizona Computer Science Standards

Grade Level: 6

Concept: Computing Systems

Subconcept: Devices

Standard 1

Compare how computing devices are designed based on an analysis of how users interact with devices.

The study of human–computer interaction (HCI) can improve the design of devices, including both hardware and software. Teachers can guide students to consider usability through several lenses.

Practice(s): Recognizing and Defining Computational Problems: 3.3

1. Consider recommendations from Framework for standards development
 - Recommendation 1: Standards should set rigorous learning goals that represent a common expectation for all students.
 - Recommendation 2: Standards should be accurate yet also clear, concise, and comprehensible to educators.
 - Recommendation 3: Standards should be limited in number.
 - Recommendation 4: Grade-by-grade standards should be designed to provide a coherent progression within each grade band.



AZ CS Standards Exemplar

- Revisit Draft Standards from your group that were created during the 8 March meeting
- Re-work to match exemplar given
- Don't forget to align to practices
- Keep crosscutting concepts in mind

Lunch

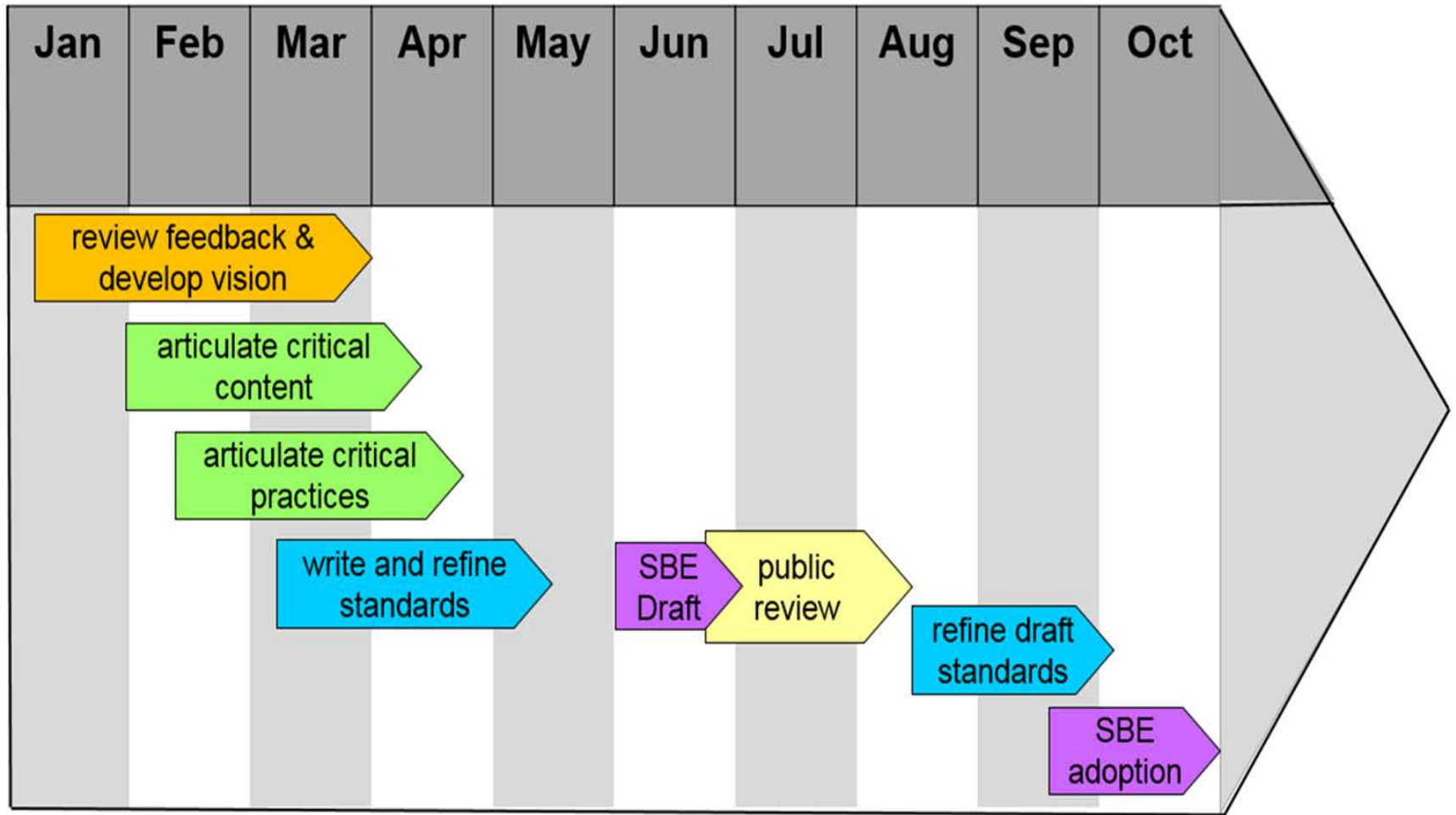


AZ CS Standards Creation (Cont'd)

- In small groups, provide input on proposed AZ CS Standards
- Use CSTA and NV standards as a baseline to build from
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CS Standards Development Outline



*ongoing internal review

We can't thank you
enough. You ARE
making a
difference for our
students.

