



## September 2022 - New Science and STEM Professional Learning!

<https://bit.ly/ADE-SciencePD>

### Effective Discourse Strategies



#### Effective Discourse Strategies for Inclusive STEM Classrooms



This session is designed to help teachers deepen their understanding of the effective and practical strategies to facilitate academic discourse that promotes inclusive science and STEM classrooms.

The instructional strategies used in this presentation will promote student engagement, differentiation, and scientific understanding to help form a more inclusive learning environment where all students can participate in scientific discourse.



#### Face to Face Events

October 12: 9:00-11:00am  
October 26: 9:00-11:00am  
@ADE North

Register at:  
[bit.ly/ADE-SciencePD](https://bit.ly/ADE-SciencePD)



### 5 New PD Experiences for Administrators



#### Science PD for Administrators





#### Face to Face Events

August 23: 9:30-11:30am  
September 14: 9:30-11:30am  
@ADE North



#### Virtual Events

September 8: 9:30-11:00am  
October 13: 9:30-11:00am  
November 17: 9:30-11:00am

#### Title:

Guidance for Administrators- What to Look For in a 3-Dimensional Science Classroom

#### Description:

For all administrators, coaches, and educators who support or teach the Arizona Science Standards. The ADE Science & STEM Team developed this experience to help administrators learn how best to support science educators w/transitioning to 3-dimensional teaching and learning using tools from ADE's Administrator Toolkit.

Register here: [bit.ly/ADE-SciencePD](https://bit.ly/ADE-SciencePD)



## Full-immersion PD for Science Educators to Experience 3-D in ACTION!



**\*NEW\* Full-immersion PD for Science Educators!**

**3-D in ACTION!**  
Putting the 3-Dimensions of Science Instruction Together

**Face to Face Events**

September 21: 12:30-3:30pm  
October 19: 12:30-3:30pm  
December 14: 12:30-3:30pm  
@ADE North

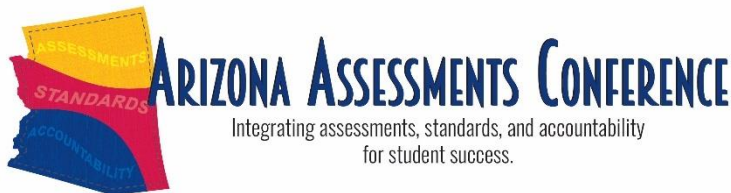
Register at: [bit.ly/ADE-SciencePD](https://bit.ly/ADE-SciencePD)

Curious to know "HOW" to teach 3-dimensional science?  
**Want to see it in action?**  
Join this new, full-immersion professional development experience where participants engage in a 3-dimensional lesson from start to finish as learners. We will discuss how to seamlessly integrate the science and engineering practices, the crosscutting concepts, and the core ideas into a lesson!

Registration link for Discourse Strategies! <https://bit.ly/ADE-SciencePD>

Registration link for Administrators PD: <https://bit.ly/ADE-SciencePD>

Registration link for 3-D in Action! <https://bit.ly/ADE-SciencePD>



### Arizona Assessment Conference

The Arizona Assessments Conference will be held in person **September 26-28, 2022** at the

**Renaissance Phoenix Glendale Hotel and Spa**, 9495 W. Coyotes Blvd., Glendale, AZ 85305. Please bookmark the [conference website](#) for all the latest information.

[Participant registration](#) is open. Registration is \$425 per person and must be completed in ADE's Event Management System. For more information, please visit the [Registration page](#) of our conference website.

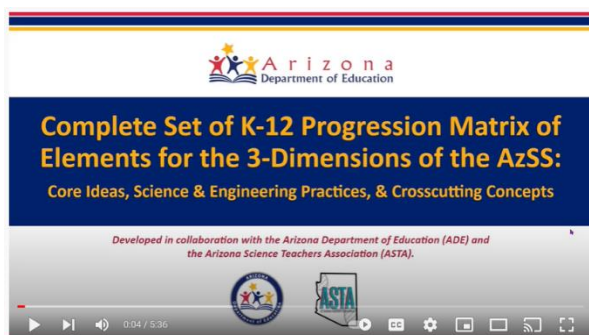
[Guest rooms](#) are still available at the conference hotel, Renaissance Phoenix Glendale Hotel and Spa. The group room rate is \$121 per night plus applicable state taxes and is subject to availability. This room rate is available for room reservations made before **September 5, 2022** or until the conference room block is sold out, whichever comes first. If you will need a guest room, please reserve it as soon as possible as the room block is expected to sell out.

The [conference agenda](#) and information about [keynote speakers](#) is published on our website.

A daily schedule of breakout sessions, including session descriptions and presenter biographies, is coming soon! We will also be using the Guidebook mobile app for this conference. Please bookmark the [Schedule, Sessions, and Guidebook page](#) of our website - details will be published here in the next few weeks.

If you have any questions, please contact ADE's Assessment team at [Testing@azed.gov](mailto:Testing@azed.gov).

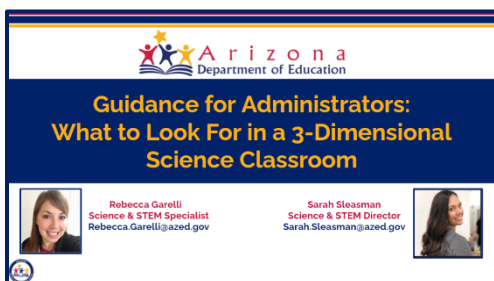
**\*NEW\* Complete Set of K-12 Progression Matrix of Elements for the 3-Dimensions of the Arizona Science Standards - Core Ideas, Science & Engineering Practices, & Crosscutting Concepts**



The Science and STEM Team is excited to have the [Complete Set of K-12 Progression Matrix of Elements for the 3-Dimensions of the Arizona Science Standards - Core Ideas, Science & Engineering Practices, & Crosscutting Concepts](#) this is housed on the [Science Standards website](#) (under the Vertical Progressions tab). This work was led by the Arizona Department of Education and the Arizona Science Teachers Association. These vertical progressions will help you understand how and what students are expected to know and

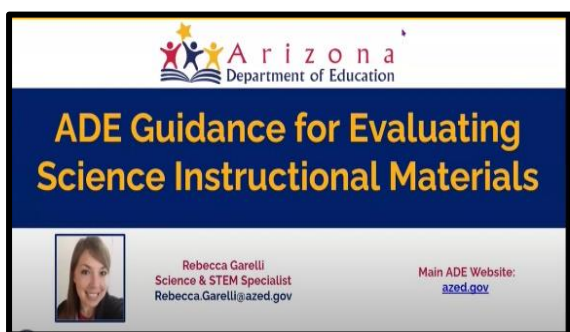
do in each grade-band, builds on what they have learned in earlier grades and prepares them for what they are expected to learn in later grades. The expectations for each gradeband are called “elements,” which are illustrated as bullets in each of the matrixes. In addition this document will help to clarify standards by given boundaries, clarifying statements, and notes to inform instruction. View this [Video intro](#) for more information about how to read and use this document.

### Administrators Webinar & Toolkit



**\*NEW\*** [Guidance for Administrators- What to Look For in a 3-Dimensional Science Classroom PD Video | PDF | Resource Page](#) - A webinar for Administrators to help with supporting educators with the transition to the 2018 Science Standards. Additionally, we have an Administrators Toolkit full of resources to help administrators support science educators. Click on our [main science website](#) and scroll down to “Administrators Toolkit.”

### ADE Guidance for Evaluating Science Instructional Materials



Looking for guidance when evaluating science instructional materials? Use this helpful tool, which is full of resources to help educators and district leaders understand how the Arizona Science Standards compare to the Next Generation Science Standards, as well as tools for evaluating instructional. For a quick review of this tool, watching the short video that accompanies it! [ADE Guidance for Evaluating Science Materials Resource Page | Video](#)

**\*NEW\* Online Self-Paced Courses Available for PD Credit!**

[Click here to register for this course!](#)



The banner features a blue border. At the top, it says "Science & STEM Self-Paced Online Courses" in blue and red text, flanked by an atom icon and a gear icon. Below this, on a yellow background, are four laptop icons with the following text: "1.25 PD Clock Hours", "Self-Paced", "Certificate of Completion", and "FREE!!". To the right of these is a large blue number "6" followed by the text "Available Courses". At the bottom, a white bar contains the registration link "Register at: [bit.ly/ADE-SciencePD](https://bit.ly/ADE-SciencePD)" and the Arizona Department of Education logo.

### Available Online Courses:

- A Look at Arizona's New Science Standards - Self-Paced Online Course- A Look at Arizona's Science Standards
- Crosscutting Concepts: 1 of the 3 Dimensions of the AZ Science Standards - Self-Paced Online Course
- Science & Engineering Practices: 1 of the 3 Dimensions of the AZ Science Standards - Self-Paced Online Course
- Core Ideas: 1 of the 3 Dimensions of the AZ Science Standards - Self-Paced Online Course
- What Secondary Science Educators Need to Know About Performance Tasks - Self-Paced Online Course
- What Elementary Science Educators Need to Know About Performance Tasks - Self-Paced Online Course

### Webinars on the go! Watch a webinar on YOUR TIME!



A sidebar with a blue header "PROFESSIONAL DEVELOPMENT VIDEOS". Below it are three blue buttons with white text: "▶ Recorded Webinars", "▶ Science Standards Videos", and "▶ Timeline and Resources".

ADE is pleased to announce that we have many newly recorded webinars available for use on our main Science Standards website located [here](#). Scroll down and click on the drop-down menu titled "Recorded Webinars." The webinars are now "packaged" on the website and include the video of the webinar, a PDF of the presentation, and a resource page with links to all resources used during the live webinar! Are

you new to 3-dimensional instruction and don't know what webinar to start with? Or are you ready for instructional practices to support 3-dimensional teaching and learning? ADE has a [Webinar Pathways for 3-Dimensional Science Instruction](#).

Here are the new recorded webinar packages (click links):

**\*Updated 2/21\*** [A Look At Arizona's New Science Standards Video | Pdf | Resource Page](#)

[5-E Instructional Model And Science Notebooks Video | Pdf | Resource Page](#)

**\*Updated 3/21\*** [Phenomenon-Based 3-Dimensional Instruction Video | Pdf | Resource Page](#)



[Science And Engineering Practices: 1 Of The 3 Dimensions Of The Az Science Standards](#)

[Video | Pdf | Resource Page](#)

[Crosscutting Concepts: 1 Of The 3 Dimensions Of The Az Science Standards Video | Pdf | Resource Page](#)

[Constructing Explanations And Arguing From Evidence Using Claims, Evidence, Reasoning \(Cer\)](#)

[Video | Pdf | Resource Page](#)

[Core Ideas: 1 Of The 3 Dimensions Of The Az Science Standards Video | Pdf | Resource Page](#)

[What Secondary Science Educators Need To Know About Performance Tasks Video | Pdf | Resource Page](#)

[What Elementary Science Educators Need To Know About Performance Tasks Video | Pdf | Resource Page](#)

[Sep Asking Questions: Students Drive Instruction With Driving Question Boards! Video | Pdf | Resource Page](#)

[Transforming Science Learning: Engaging Students In The Science & Engineering Practices Using Digital Tools Video | Pdf | Resource Page](#)

[Seps, Cccs, And Core Ideas: Putting The 3-Dimensions Together Video | Pdf | Resource Page](#)

## **This Fall Nominate a Colleague for Presidential Awards for Excellence in Mathematics and Science Teaching**

[The Presidential Awards for Excellence in Mathematics and Science Teaching \(PAEMST\)](#) are the nation's

highest honors for teachers of mathematics and science (including computer science are the

highest honors bestowed by the United States government specifically for K-12 science, technology, engineering, mathematics, and/or computer science teaching. The Awards were established by Congress in 1983. **This cycle will be MS and HS. If you haven't**

**been an awardee, consider reapplying. If you are an awardee or working with science educators, pay it forward and nominate someone else.** To find more information visit the [PAEMST website](#).



**#PAEMST** nominations for 7-12th grade STEM teachers are open now. Want to recognize an outstanding math or science teacher? Nominate them for the **#PAEMST!** <https://paemst.org>

**THE PAEMST  
2022-2023  
APPLICATION CYCLE  
HAS LAUNCHED!**

Nominate a 7-12th grade STEM teacher today!

[WWW.PAEMST.ORG](http://WWW.PAEMST.ORG)

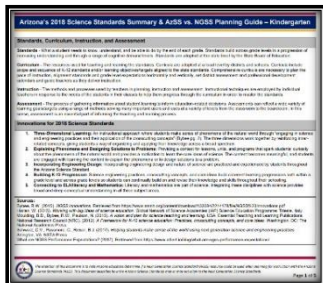
**Awardees receive:**  
a certificate signed by the President;  
a \$10,000 award from NSF;  
a trip to D.C.; and  
join a national cohort of more than 5,200 teachers.

## Gather, Reason, Communicate (GRC) Lessons



Are you looking for an instructional approach, and resources, that align to 3-Dimensional Instruction? Brett Moulding's [#Going3Dw/GRC website](#) has a collection of vetted, three-dimensional lessons aligned to the Next Generation Science Standards and state standards developed from the Framework for K-12 Science Education. The lessons were developed by teachers across districts and states utilizing local phenomena. The teachers who developed these lessons participate in professional development with Brett D. Moulding and Kenneth L. Huff over the past five years. Brett was on the committee that wrote the Framework for K-12 Science Education and a lead writer of the NGSS. Kenneth was also on the NGSS writing team and has spent the last 5 years applying these lessons in his classroom. Good news! Arizona educators have written a few Arizona-specific lessons that align to the 2018 AZ Science Standards!

## Complete Set K-12 Summaries that Compare the AzSS to NGSS



A new addition, a [complete set for K-12](#) combined into one document! Curious to know how each of the new Arizona Science Standards (AzSS) compares to the Next Generation Science Standards (NGSS)? The ADE, with the help of our Educator Leadership Team, created a new document called "Arizona's 2018 Science Standards Summary and AzSS vs. NGSS Planning Guide". These documents describe if the Next Generation Science Standards have a "strong," "partial," or "no correlation" to the Arizona Science Standards. This planning summary and guide can help districts and educators find resources, plan lessons, and understand more deeply how Arizona Science Standards compare to the national standards. Here are the documents for each grade level, and you can also [visit our website](#) and click "Planning Tools" to find these documents.

[Kindergarten](#) | [First Grade](#) | [Second Grade](#) | [Third Grade](#) | [Fourth Grade](#) | [Fifth Grade](#) | [Sixth Grade](#) | [Seventh Grade](#) | [Eighth Grade](#) | [High School](#)

**Use the Arizona Science Standards Snapshot to Help with Planning for 3-Dimensional Science Instruction.** This tool is to guide teaching and learning on what you should see students doing, thinking, knowing, and using in science.

AzSS Snapshot: What You Should See Students "Doing," "Thinking," "Knowing," and "Using" in Science			
A Framework/Big Ideas for K-12 Science Instruction's 3-Dimensions and AzSS Using Science			
<b>DO</b>	<b>Dimension 1: The Science and Engineering Practices</b> 1. Asking questions and defining problems (p. 54)* 2. Developing and using models (p. 56)* 3. Planning and carrying out investigations (p. 59)* 4. Analyzing and interpreting data (p. 61)* 5. Using mathematics and computational thinking (p. 64)* 6. Constructing explanations and designing solutions (p. 67)* 7. Engaging in argument from evidence (p. 71)* 8. Obtaining, evaluating, and communicating information (p. 74)*		<b>Dimension 2: The Crosscutting Concepts</b> 1. Patterns (p. 85)* 2. Cause and effect (p. 87)* 3. Scale, proportion, and quantity (p. 89)* 4. Systems and system models (p. 91)* 5. Energy and matter (p. 94)* 6. Structure and function (p. 96)* 7. Stability and change (p. 98)*
	<b>Dimension 3: The Core Ideas of Knowing Science and The Core Ideas of Using Science</b> <b>The Core Ideas of Knowing Science</b> P: Physical Science (p. 189)* P1: All matter in the Universe is made of very small particles. (p. 201)* P2: Objects can affect other objects at a distance. (p. 211)* P3: Changing the movement of an object requires a net force to be acting on it. (p. 221)* 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. (p. 231)* E: Earth and Space Science (p. 171)* 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. (p. 241)* E2: The Earth and our solar system are a very small part of one of many galaxies within the Universe. (p. 251)* L: Life Science (p. 141)* L1: Organisms are organized on a cellular basis and have a finite life span. (p. 261)* L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms. (p. 271)* L3: Genetic information is passed down from one generation of organisms to another. (p. 281)* L4: The unity and diversity of organisms, living and extinct, is the result of evolution. (p. 291)*		<b>The Core Ideas of Using Science</b> U1: Scientists explain phenomena using evidence obtained from observations and/or scientific investigations. Evidence may lead to developing models and/or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. (p. 30 & 31)* U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. (p. 32)* U3: Applications of science often have ethical, social, economic, and/or political implications. (p. 23)*

## Disciplinary Literacy & the 2018 AZ Science Standards

Disciplinary literacy in science focuses on how reading, writing, speaking, and listening are used to develop sense-making in science. ADE has created documents that illustrate how disciplinary literacy skills develop in science and possible strategies teachers can use while helping their students deepen their understanding of science content and practices. Here are links to the ADE Disciplinary Literacy documents by grade-band: [K-2](#), [3-5](#), [6-8](#), [9-12](#).



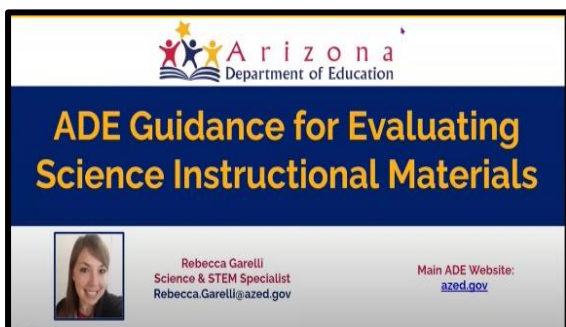
### Discourse in Science

Productive Science Talk & Student **Science talk** is an instructional discourse practice that capitalizes on this enthusiasm and gives students regular and deliberate opportunities to process their thinking and communicate about what they have seen and done. Through exchanging views with others, students develop their understanding of the science beyond what could be achieved individually. The ultimate goal of **science talk** is to create a discourse-rich classroom culture where the natural synergy between language and meaning making supports all students in expressing ideas, developing language and acquiring new knowledge of scientific phenomena. Here are a few resources to help you engage your students in Productive Science Talk: [Talk Science Primer](#), [Talk Moves Checklist](#), [STEM-Teaching-Tool-6-Productive](#)

### Science Talk.

Additional STEM Teaching Tools that can help educators support student discourse include: [#16](#), [#35](#), and [#48](#).

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## AzSCI – Arizona Science Test

### Get SET for STEM Scholarship



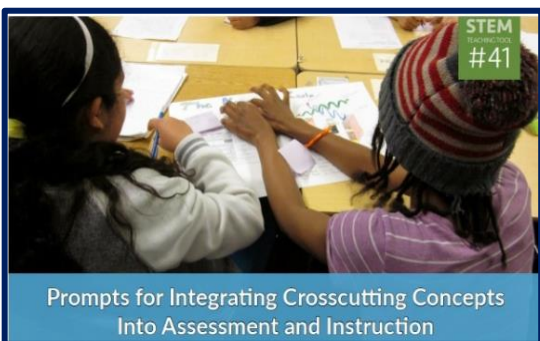
Develop projects and programs geared toward state-mandated competencies.

Use funds for innovative teaching strategies that improve student performance objectives in math and science.

Certified AZ teachers: apply NOW for a \$2,000 professional development (PD) scholarship. Teachers have three years to use the \$2000. Apply at [Arizona Department of Education's website](#).

Professional development must support a certificated teacher in gaining additional credentials (e.g., qualify to teach dual enrollment physics or chemistry) and/or certifications in math, a science subject, technology, engineering or career & technical education.

### STEM Teaching Tool #41

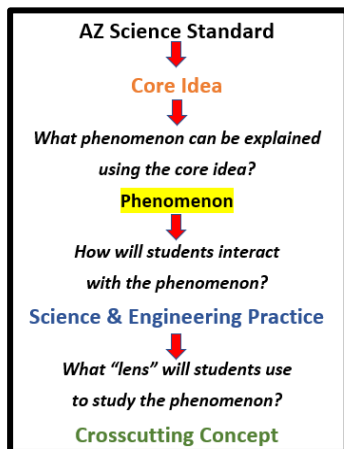


[STEM Teaching Tool #41](#), Prompts for Integrating Crosscutting Concepts Into Assessment and Instruction, is a set of prompts is intended to help teachers elicit student understanding of crosscutting concepts in the context of investigating phenomena or solving problems.

These prompts should be used as part of a multi-component extended task. These prompts were developed using the Framework for K-12 Science Education and Appendix G of the Next Generation Science Standards, along with relevant learning

sciences research.

### Phenomena-Based 3-Dimensional Instruction Resources

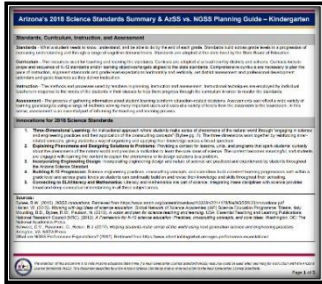


**Phenomena** are observable events that can be explained or explored. ADE developed a [tool](#) to help guide the selection of three dimensions to integrate during instruction and also encourage educators to focus on phenomena. In addition, here are two resources that can also help with selection of phenomena and designing 3-dimensional instruction: [STEM Teaching Tool #42](#) and [STEM Teaching Tool #28](#).

(The department recognizes that the acronym NGSS is consistently used throughout resources provided on our website. To ensure clarity and avoid confusion the new Arizona Science Standards and the National NGSS standards are both designed from the A Framework for K-12 Science Education with a focus on three-dimensional instruction, this includes: Science and Engineering Practices, Crosscutting Concepts and Core Ideas. Arizona Science standards also used Working with Big Ideas of Science Education when creating the Core Ideas.



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**LOCAL PARTNERS**

**STEMAZING Project- \*NEW\* Resources Aligned to Arizona Science Standards!!!**



Pima County Superintendent Office has a project called STEMAZing! The team has tons of resources, professional development opportunities, and digital notebook examples! Look for the [AzSS-Aligned Resources](#) by grade level in the [K-2](#), [3-5](#), [6-8](#), [HS](#) grade

band folders. Visit the [STEMAZing project](#), resources, or [register for an upcoming event!](#)

**\*NEW\* and growing list of AZSS-Aligned Resources:**

<https://stemazing.org/arizona-science-standards-aligned-resources/>

You can also follow the STEMAZing project on social media & sign up for the newsletter:

**Facebook:** <https://www.facebook.com/TheSTEMAZingPro/> / **Twitter:** <https://twitter.com/TheSTEMAZingPro>

[Sign up for The STEMAZing Newsletter!](#)