

Standard I **Element C**

LEVEL 2 PRACTICES

THE TEACHER:

Implements:

4 ***Content-based instructional strategies that best align to the learning objective.***

When you combine your knowledge of the content with your knowledge of how to teach it, you are transforming the content through pedagogy.

Teacher can explain the use of the instructional strategy for the lesson and how it best aligns to the learning objective. Teacher can reflect on that lesson and knows when reteaching is necessary based on formative assessments. (APS, June 2018)

The term pedagogical content knowledge was coined by Lee Shulman in the mid 80s. He stated that teacher-training programs were separating the what (content) from the how (pedagogy) when preparing teachers for the field. Good teachers, according to Shulman, move beyond simply knowing their subject matter, and knowing how to teach; they transform the subject matter through teaching. More concretely, he says good teachers find “ways of representing and formulating the [subject](#) that make it comprehensible to others”.

<https://blog.learningbird.com/pedagogical-content-knowledge/>

5 ***Multiple models and delivery methods to explain concepts accurately.***

Explanations of content can be provided in a variety of ways. The teacher may model examples of the skills being taught through direct instruction or modeling, provide visuals or labels that illustrate new content, and/or provide analogies for new ideas and concepts. Whichever method is utilized, it is critical that the teacher’s explanations (oral and written) are accurate to support all students in being successful with the rigor required by the Colorado Academic Standards. Explanations that are *accurate* are void of error or misinformation. They provide students with the knowledge and skills they need to correctly apply the content being taught.

Using a variety of explanations and multiple representations recognizes that students learn in different ways and need opportunities to make connections across concepts and ideas. While it is important for the teacher to present content through a variety of explanations and representations, students also need opportunities to engage with the content and demonstrate their learning in a variety of ways. If a student can represent a concept in a variety of ways, the teacher knows she truly understands it.

Multiple representations may include:

- Written explanations
- Symbols
- Visuals, such as maps, graphic organizers, and illustrations
- Real-world examples
- Manipulatives

Teachers can build on students’ prior experiences and knowledge of representations to further advance their thinking from concrete to abstract. When selecting representations to use, teachers should consider how they support students in developing both procedural skills and conceptual understanding. These levels of understanding are critical for students to meet the demands of the Colorado Academic Standards.

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Mathematics teachers can refer to the Common Core Standards for Mathematical Practice for more information related to the expectations related to multiple representations or to this external resource for Standards for Mathematical Practice and lesson plan examples: <http://www.insidemathematics.org/index.php/mathematical-practice-standards>

Refer to this internal resource for additional information:

- [Engaging Students in the Use of Multiple Representations](#)
Document provides ideas for how students may represent their learning in different content areas using multiple representations.

6 **Questioning techniques to support disciplinary inquiry.**

It would seem that [inquiry-based instruction](#) might have powerful effects where students have the cognitive capacity to think critically but have not previously been encouraged to think in this way. Overall, inquiry-based instruction was shown to produce transferable critical thinking skills as well as significant domain benefits, improved achievement, and improved attitude towards the subject. (Hattie, 2009, p. 209)

Our minds (teachers) must stimulate theirs (students) with questions and yet further question; questions that probe information and experience; questions that call for reasons and evidence; questions that lead students to examine interpretations and conclusions, pursuing their basis in fact and experience; questions that help students to discover their assumptions, questions that stimulate students to follow out the implications of their thought, to test their ideas, to take their ideas apart, to challenge their ideas, to take their ideas seriously. It is in the totality of this intellectually rigorous atmosphere that natural curiosity thrives. (Paul, Willson, & Binker, 1995)

Students engage in inquiry learning experiences by developing questions and investigating in order to find solutions. Teachers facilitate learning as students engage in active problem solving, the construction of meaning, and the communication of new understandings.

The teacher can guide student learning by selecting, designing, and planning learning tasks that are open-ended; asking probing questions; observing students at work to identify misconceptions; and planning follow-up experiences. Well-constructed inquiry methods allow students' entry to the problem from different points and encourage divergent thinking. Students are able to engage in thinking like an expert (e.g., mathematician, scientist, and historian).

Strategies for improving classroom discourse:

- *Create a classroom culture open to dialogue:* Students feel free to respond to the teacher's questions, challenge peers' responses, and ask their own questions.
- *Use both preplanned and emerging questions:* The teacher preplans questions that will be asked based on the learning objective and students. However, questions are also asked that result from students' response and questions.
- *Address questions to the group or to individuals randomly:* A variety of response methods is utilized to engage all students in responding to questions and to hold students accountable for formulating responses and developing their own questions.
- *Use sufficient wait time:* Provide students sufficient time to formulate responses. Communicate the expectation that everyone needs a few seconds of "think time" to process the question and their response.

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Refer to these external resources for additional information:

- Article: “Inquiry-Based Instruction Explores, Then Explains” by Jeff Marshall
<http://www.ascd.org/ascd-express/vol9/909-marshall.aspx>
Article describes the inquiry method as the explore-then-explain method and provides an example for a science lesson.
- Website: Concept to Classroom Workshop: Inquiry-based Learning Educational Broadcasting Company
<http://www.thirteen.org/edonline/concept2class/inquiry/index.html>
Website defines inquiry-based learning, describes its benefit, and provides ideas for implementation.
- Video: Jeffrey Wilhelm on Inquiry-based Learning
<http://www.youtube.com/watch?v=3x-pTBZw8mg>
Video describes an inquiry-based lesson on Romeo and Juliet that includes differentiation based on language and culture.
- Video: Inquiry-based Learning
<http://www.youtube.com/watch?v=sLQPXd8BiIA>
Video outlines steps for creating inquiry-based learning activities.
- Article: “Four Strategies to Spark Curiosity via Student Questioning” by Kevin D. Washburn
<http://www.edutopia.org/blog/build-curiosity-questioning-strategies-kevin-washburn>
Article describes strategies for stimulating student curiosity through questioning.
- Article: “How to Get Students Talking! Generating Math Talk that Supports Math Learning” by Lisa Ann de Garcia
http://www.mathsolutions.com/documents/How_to_Get_Students_Talking.pdf
Article defines discourse in the mathematics classroom and describes practices for high-quality discourse.
- Article: “Never Say Anything a Kid Can Say” by Steven Reinhart
<https://www.georgiastandards.org/resources/Online%20High%20School%20Math%20Training%20Materials/Math-I-Session-5-Never-Say-Anything-a-Kid-Can-Say-Article.pdf>
Article describes questioning process used by a teacher and includes several strategies he has had success with in his classroom.

Planning/Coaching Questions

- How did you scaffold questions, concepts, and skills to support student learning of the content?
- How will you select accurate and appropriate instructional strategies and materials for each lesson?
- How will you plan for and implement review of previously learned concepts or skills in my lessons?
- How will you ensure the instruction and student activities align to the learning objective(s) and criteria for student mastery?
- How will you provide multiple models and delivery methods to explain concepts accurately?
- What are the likely student misconceptions that will arise during this lesson? How can I address those misconceptions during instruction?
- How will I engage ensure tasks are challenging and provide opportunities for students to ask questions and construct new meaning?
- How will I utilize questioning techniques to engage students in disciplinary inquiry?

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