

## Implementing the Crosscutting Concepts embedded in the Colorado Academic Standards for Science

### Goals:

By the end of the three sessions, K-12 science teachers will be able to:

1. Analyze how Crosscutting Concepts (CCCs) connect different domains of science and support student sense-making across grade levels
2. Design instructional activities that explicitly incorporate CCCs to deepen student understanding of scientific phenomena

### Session 1:

Outcomes	Agenda
<p>By the end of the session, educators will:</p> <ol style="list-style-type: none"> <li>1. Be able to match CCCs with their definitions accurately and recognize CCCs in different scientific contexts during the interactive</li> <li>2. Demonstrate their ability to use CCCs as a conceptual framework to make sense of novel scientific information, as evidenced by their participation in CCC stations and the debrief discussion.</li> </ol>	<ol style="list-style-type: none"> <li>1. Welcome &amp; Brief Recap of Three Dimensional Instruction <ul style="list-style-type: none"> <li>• Provide context for <a href="#">crosscutting concepts</a> in the standards with <a href="#">this video</a></li> </ul> </li> <li>2. Interactive Crosscutting Concepts Exploration <ul style="list-style-type: none"> <li>• Part 1: <a href="#">Speed Dating: Match CCC with definition</a></li> <li>• Part 2: <a href="#">CCC Stations: Identifying CCCs at stations</a></li> </ul> <p>Note: Above activities are amended for a virtual setting.</p> </li> <li>3. Debrief <ul style="list-style-type: none"> <li>• CCCs are important because students can use them as a conceptual framework to organize new ideas and draw connections between different content areas and practices.</li> <li>• Psychological research indicates that the way experts and novices think about a topic (say chess) is very different. Experts use conceptual frameworks to guide their thinking when making sense of novel information. This is where the value of CCCs comes in as they are tools to help students build a conceptual framework for making sense of scientific ideas.</li> </ul> </li> </ol> <p>Resources:</p> <p><a href="#">Printable PDFs of CCCs in English and Spanish for hanging in your classroom</a></p> <p><a href="#">STEM Teaching Tool #41</a> (<a href="#">Access in student friendly format here</a>)</p>

### Session 2:

Outcomes	Agenda
<p>By the end of the session, educators will:</p>	<ol style="list-style-type: none"> <li>1. Welcome &amp; Revisit the role of <a href="#">cross cutting concepts</a> from session 1 (chess example of expert vs. novice thinking) <ul style="list-style-type: none"> <li>• <a href="#">Warm-up: matching cross cutting concepts with</a></li> </ul> </li> </ol>

<ol style="list-style-type: none"> <li>1. Demonstrate their ability to generate questions using CCCs to investigate new scientific phenomena, showing their understanding of how CCCs can be applied to various instructional contexts.</li> <li>2. Create a set of generic question stems using CCCs, which can be applied to multiple scientific investigations, enhancing their ability to use CCCs explicitly in their learning process.</li> </ol>	<p><a href="#">instructional activities</a></p> <ol style="list-style-type: none"> <li>2. Interactive Phenomenon Routine - Crosscutting Concepts as a sensemaking tool. <ul style="list-style-type: none"> <li>• <a href="#">Instructional Routine: Generating questions to figure out a new scientific phenomenon</a></li> </ul> </li> <li>3. Debrief <ul style="list-style-type: none"> <li>• Crosscutting Concepts are tools that help students make sense out of new phenomena.</li> <li>• One way to make cross cutting concepts more explicit in instruction is by using the crosscutting concepts to develop question stems for whatever phenomenon students are investigating.</li> <li>• Develop a set of generic question stems using crosscutting concepts, that you might be able to use with several investigations in the classroom.</li> </ul> </li> </ol> <p>Resources:  <a href="#">NSTA article with rubrics</a>  <a href="#">The Wonder of Science CCCs</a></p>
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### Session 3:

Outcomes	Agenda
<p>By the end of the session, educators will:</p> <ol style="list-style-type: none"> <li>1. Demonstrate their ability to use the Task Checklist to recognize and apply CCCs in their current tasks and assessments, enhancing their ability to use CCCs as a framework for understanding new phenomena.</li> <li>2. Use the checklist and assessments from the Contextus database to develop strategies for incorporating CCCs into their own learning and teaching practices, building on the questions generated in session 2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Welcome and Revisit Crosscutting concepts as a tool for student sensemaking. This time we will focus on recognizing crosscutting concepts in instructional and assessment tasks.</li> <li>2. Interact with curated assessment tasks using the <a href="#">Task Checklist</a> to consider the role of crosscutting concepts in facilitating student learning. <ul style="list-style-type: none"> <li>• Selected Tasks taken from <a href="#">Contextus</a></li> </ul> </li> <li>3. Debrief <ul style="list-style-type: none"> <li>• Crosscutting Concepts are tools that help students make sense out of new phenomena. How did you notice this in the instructional/assessment tasks you examined?</li> <li>• Use this checklist with your current tasks and/or use assessments from the Contextus database as tools to help students answer the questions they generated from session 2.</li> </ul> </li> </ol> <p>Resources:  <a href="#">Crosscutting Concept Cards</a>  <a href="#">Crosscutting Concept Questions and Graphic Organizers</a></p>

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