Science Content Leader Assessment Series

Building Understanding through Phenomenon-Based Instruction

Definition: Phenomenon-based instruction centers itself on real-world examples of natural and designed scientific phenomenon and asks students to use critical thinking skills as well as their prior knowledge to determine what causes a phenomenon, as opposed to just learning about the cause.

Underlying Principles: Science content leaders teaching phenomenon-based instruction must be able to:

- Unpack phenomenon-based instruction and the anchoring phenomenon of a lesson set.
- Launch a phenomenon-based lesson set with an anchoring phenomenon routine.
- Facilitate learning so students make their own connections between the anchoring phenomenon and related phenomena.
- Support student understanding as it progresses within and between lessons.

Rationale: Explaining phenomena allows students to build general science ideas in the context of their application to understanding phenomena in the real world, leading to deeper and more transferable knowledge.

- **ANALYZE** the first set of 2-5 lessons that you will teach in your science classroom in an upcoming unit. Identify the anchor phenomenon.
- **DEVELOP** a plan to facilitate the lessons you selected in Analyze by annotating the lesson set to describe the anchor phenomenon routine.
- **IMPLEMENT** the phenomenon-based lesson set with your students and collect 3-5 artifacts that demonstrate your implementation.
- **EVALUATE** the implementation of your instruction using examples to support your response.

Teaching for Three-Dimensional Learning

Definition: Teaching for three-dimensional learning explores how educators plan for and implement the three dimensions of the science standards: disciplinary core ideas, crosscutting concepts, and science and engineering practices in a science classroom.

Underlying Principles: Science content leaders engage in best practices of teaching three-dimensional learning when they:

- Identify the key features of three-dimensional learning and how they allow students to build knowledge and skills over time (e.g., lesson-to-lesson, unit-to-unit, grade-to-grade, etc.).
- Plan instructional supports to ensure all students engage in three-dimensional learning.
- Support all students' learning as they engage with three-dimensional instruction.

Rationale: When students are able to engage with science concepts through three-dimensional instruction, they more deeply learn science content, understand connections to prior and future lessons, and are more invested in their own learning.

- **ANALYZE** an upcoming set of lessons. Annotate the lessons with notes identifying the performance expectations (PEs), the disciplinary core ideas (DCIs), crosscutting concepts (CCCs), and science and engineering practices (SEPs) of the high-quality curriculum.
- **DEVELOP** a plan to support students' use of one SEP in a lesson by completing a graphic organizer.
- **IMPLEMENT** the lesson you planned and submit a video of your implementation.
- **EVALUATE** the implementation of your instruction using examples from your preparation and/or implementation of the entire lesson set from Analyze, including the lesson you taught in Implement .

Science Content Leader Assessment Series

Supporting Student Sensemaking through Productive Discussion

Definition: Productive discussion in the science classroom engages students and encourages them to articulate their thoughts, clarify their thinking, engage with peers' ideas, and use collaborative reasoning to support student sensemaking.

Underlying Principles: In order to support student sensemaking through productive discussion, science content leaders should be able to:

- Effectively plan for and facilitate a productive discussion using science "talk moves."
- Anticipate and plan for misconceptions that students may have during the productive discussion.

Rationale: Educators who facilitate productive discussion in their classrooms provide a deeper learning experience for their students. Productive discussions in the science classroom encourage participation in specific lessons, provide opportunities for checking and course-correcting student understanding, and help students make their own connections to phenomena and science concepts.

- **ANALYZE** your previous experience facilitating productive discussions.
- **DEVELOP** and submit a plan for a productive discussion.
- **IMPLEMENT** the productive discussion you planned and submit a video of your implementation.
- **EVALUATE** the implementation of your discussion using examples to support your response.

Leading Common Planning Time

Definition: Common Planning Time is essential to establishing a culture of collaboration and continuous improvement that leads to equitable and effective classroom instruction. During Common Planning Time, teachers should be working alongside grade-level, content-area peers to prepare units and lessons using their curricular materials.

Underlying Principles: Content leaders can lead Common Planning Time most effectively when they:

- Establish a positive and cohesive professional culture.
- Create a plan to support the work of Common Planning Time.
- Reflect on learnings from the facilitation of Common Planning Time to inform future common planning opportunities.

Rationale: When content leaders facilitate Common Planning Time effectively, it is more likely that participating educators will focus on improving learning experiences for students.

- **ANALYZE** what you and participants will need to do to prepare for a successful Common Planning Time session. Prepare a pre-communication to participants.
- **DEVELOP** an agenda for the upcoming Common Planning Time session.
- **IMPLEMENT** the session and submit a video. Prepare a post-communication to participants.
- **EVALUATE** the implementation of your Common Planning Time by pointing to specific examples from your implementation.