K-12 Science Balanced Instruction

|  |  |
| --- | --- |
| **Balanced Science Actions that Support TKES** | **Strengths/Next Steps** |
| **1. Professional Knowledge*** Lesson addresses Science CTLS Standard by engaging students in using core ideas, science and engineering practices, and crosscutting concepts to make sense of phenomena and/or design solutions to problems.
* Teacher demonstrates appropriate content knowledge and best practices to facilitate student learning of core ideas, practices, and crosscutting concepts.
 |  |
| **2. Instructional Planning*** Lesson is part of a coherent learning sequence in which students are focused on “figuring out” phenomena and not just “learning about” science concepts.
* Teacher uses a research-based instructional framework (e.g., 5Es, storylines, PBL) to develop lessons that fit together coherently to target a related set of standards.
 |  |
| **3. Instructional Strategies** * Teacher uses a variety of research-based strategies and resources to actively engage students in using grade-appropriate elements of the three dimensions to make sense of phenomena and/or to design solutions to problems.
* Students develop and investigate scientific questions relevant to the phenomenon or problem.
* Students use all three dimensions to “figure out” phenomena and not just “learning about” or memorizing science concepts.
* Teacher provides opportunities for students to express, clarify, justify, interpret, and represent their ideas and respond to peer and teacher feedback orally and/or in written form as appropriate to support student’s three‐dimensional learning.
 |  |
| **4. Differentiated Instruction*** Teacher facilitates classroom as a scientific community working collectively to use the three dimensions to explain phenomena and design solutions to problems.
* Within this community, teacher differentiates instruction to meet student needs.
 |  |
| **5. Assessment Strategies*** Teacher elicits direct, observable evidence (e.g., talking, writing, or modeling) of three‐dimensional learning to make sense of phenomena or to design solutions.
* Teacher utilizes formative assessments and ongoing feedback of three‐dimensional learning throughout instruction.
 |  |
| **6. Assessment Uses*** Teacher uses a variety of assessments and data sources to monitor student learning, provide targeted feedback, and adjust instructional plans along each of the three dimensions.
* Teacher facilitates students in self-assessing in support of three-dimensional learning.
 |  |
| **7. Positive Learning Environment*** Teacher promotes respect for student diversity, and facilitates productive classroom discourse.
* Teacher uses phenomena to connect learning to students’ diverse interest, identities, and backgrounds.
* Teacher provides safe learning experiences that give all students access to 3D science learning.
 |  |
| **8. Academically Challenging Environment*** Teacher promotes an environment of inquiry and problem solving in which explanations and solutions are valued.
* Teacher promotes rigor through development of conceptual understanding, rather than rote learning.
* Teacher promotes student self-direction in selecting and applying science and engineering practices, crosscutting concepts, and problem-solving approaches, as appropriate to the specific task.
* Teacher uses science- or STEM-based project/problem-based learning, or investigations to foster students’ critical thinking.
 |  |

\* **Overview of 3D Learning**

The Science Georgia Standards of Excellence/Cobb CTLS call for students to engage in what is called three-dimensional learning. ***Core Ideas*** define concepts that help students make sense of a the natural world and solve problems; ***Crosscutting Concepts*** define the “big ideas” that apply across all scientific disciplines; and ***Science and Engineering Practices*** describe behaviors that allow scientists to investigate the natural world and engineers to design solutions to important problems. Students should simultaneously apply core ideas, crosscutting concepts, and practices as they seek to explain real-world phenomena or solve meaningful problems.