Danielson Component 3c: Engaging Students in Learning

Description of Effective: The learning tasks and activities are fully aligned with the instructional outcomes and are designed to challenge student thinking, inviting students to make their thinking visible. This technique results in active intellectual engagement by most students with important and challenging content, and with teacher scaffolding to support that engagement. The groupings of students are suitable to the activities. The lesson has a clearly defined structure, and the pacing of the lesson is appropriate, providing most students the time needed to be intellectually engaged.

Critical Attributes of Effective

- Most students are intellectually engaged in the lesson.
- Most learning tasks have multiple correct responses or approaches and/or encourage higher-order thinking.
- Students are invited to explain their thinking as part of completing tasks.
- Materials and resources support the learning goals and require intellectual engagement, as appropriate.
- The pacing of the lesson provides students the time needed to be intellectually engaged.
- The teacher uses groupings that are suitable to the lesson activities.

Examples for Secondary Science Classrooms

These three NYSSLS/NGSS Practices facilitate student sense-making. Here are some ways that working on these Practices can support Component 3c.

Science and Engineering Practice 2	Science and Engineering Practice 4	Science and Engineering Practice 6
Developing and Using Models Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.	**Analyzing and Interpreting Data** Analyzing data in 9–12 builds on K–8 and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories.
Possible Examples (Classroom "Look-fors"): ● Students engage in discussion about the merits and limitations of a model they developed ● Students make a claim, prediction or develop an explanation using a model ● Students are asked to explain their thinking about the reliability of a model. Models include: physical, representations, drawings, computer simulations, conceptual, analogies. ● Earth & Space Science: Use a model of Earth-Moon-Sun system to generate an explanation about tides ● Physical Science: Use an element's placement on the periodic table to explain its properties ● Life Science: Use a model to explain the impact of removing a species from a food web.	**Possible Examples (Classroom "Look-fors"):** ● Students use multiple data sources and choose appropriate technology to use for analysis. ● Students think critically about the source of their data, and identify additional sources of data ● Students reflect on the impact changes in the data have on their interpretations ● Teacher uses a protocol to foster discussion about data ● Students make predictions based on what future data could reveal ● Students record their thinking about data in science notebooks ● Students describe graphs, identify errors and outlier, and explain and justify claims based on data ● Students explain why they decided to analyze the data in a particular way	**Possible Examples (Classroom "Look-fors"):** ● Students are given a phenomenon and asked to use prior knowledge to construct a preliminary explanation, which is revised based on evidence from models and investigations. ● Students reflect on how their scientific explanations have changed using the frame, "I used to think… but now I think… because…" and supporting it with evidence.

The initial work for this tool was completed by participants at the New Visions Science Leadership Summit in July, 2018. Please send comments to Dora Kastel (dkastel@newvisions.org).
More information can be found at http://science.nvcurr.org/Danielson.