

# HOW DO WE KNOW IF UNITS ARE DESIGNED FOR THE NGSS?

**The Mi-STAR team** has been asking that question since 2015, when they began to undertake the development of a complete Grade 6–8 science and engineering curriculum for the Next Generation Science Standards (NGSS). Mi-STAR is a nonprofit group that, in addition to developing and providing problem-based middle school science curriculum, provides professional learning to school districts in the Great Lakes region, with plans to expand in future years. In 2018, Mi-STAR decided to submit one of their units to the NextGenScience [Peer Review Panel](#) (PRP) for review. Launched in 2016 by Achieve, the PRP works to address the issue of insufficient and inadequate exemplars of science instructional materials designed for the NGSS.

Mi-STAR curriculum development coordinator Stephanie Tubman explains the decision to get PRP feedback. “From our project’s beginning, the Mi-STAR team recognized that designing for the NGSS is a big task, and that we would engage in many iterations. We wanted to get the PRP’s feedback to inform our revisions going forward.”

## Evaluating and Influencing Materials

Peer Review Panel (PRP) members are a national pool of reviewers who have been selected through a rigorous process. They work together to evaluate free and publicly-available instructional materials using the [EQuIP Rubric for Science](#), which provides criteria to measure how well lessons and units are designed for the NGSS.

## Providing a Unique Source of Feedback

Like many developers, Mi-STAR field-tests every unit before it is released and then gets feedback from teachers during field testing on issues such as usability. But teacher feedback doesn’t often include the same kind of details as are found in EQuIP reviews.

**“The EQuIP review process has helped us focus on what’s important, what we’re getting right, and where we can improve.”**

*Gregg Bluth, Mi-STAR Curriculum Developer*

“Both types of feedback are important,” according to Gregg Bluth, who has helped to spearhead Mi-STAR’s efforts with the PRP in recent years. “We get feedback from teachers about how materials function in the classroom, but most teachers don’t provide feedback on many criteria addressed by the EQuIP rubric. So, the review is a unique source of feedback for us. Reviews provided by the NGSS PRP

are particularly useful because they are from an external perspective and are written by researchers and professionals with deep knowledge of NGSS intent, usage, and impacts across the country.”

## Influencing the Program Blueprint

The EQuIP feedback Mi-STAR received from the PRP has resulted in positive changes not only to the reviewed unit,<sup>1</sup> but to other units in the curriculum.

Bluth explains, “This review process helped Mi-STAR identify ways to standardize the processes used to develop new units or revise and improve existing units. Mi-STAR units involve a series of phases — anchoring, uncovering, sharing, connecting, and

***EQuIP is an acronym for educators evaluating the quality of instructional products and the rubric includes 19 criteria within three categories: NGSS Three-Dimensional Design, NGSS Instructional Supports, and Monitoring Student Progress. NextGenScience provides developers with independent, third-party feedback about how well their materials meet these criteria along with suggestions for improvement. Highly-rated materials are posted on the official NGSS website as Quality Examples of NGSS Design, and top-rated materials are awarded the NGSS Design Badge.***

<sup>1</sup>The unit Mi-STAR submitted for review, **6.4. Protect Your Cell Phone: Forces and Motion**, is now available as a [free "Quality Example of a Science Unit"](#) on the official NGSS website. For more information about Mi-STAR, see <http://mi-star.mtu.edu>.

checking progress — and for each we have developed a set of principles that we keep in mind as we write units.”

“And that has a major influence on many aspects of the curriculum. For example, now we make sure that in every unit, the anchor phase elicits students’ prior experiences and that the NGSS crosscutting concepts are explicitly emphasized.”

Bluth says the entire program now contains elements that would have never been included without the EQuIP review process.

Bluth continued, “I don’t think any Mi-STAR units have been ‘untouched’ since they were first introduced, because they all go through such exacting revision processes.”



### Giving All Students a ‘Voice’

The feedback process is indeed rigorous, but worth it, he says. “Getting us to adhere to three-dimensionality really pays off because we’re providing good materials to the teachers,” Bluth says. “Teachers tell us they’re seeing positive results with their students.”

**“[EQuIP reviews] give us that all important outside perspective to understand whether we have the NGSS design we intended and how our units can improve to support students.”**

*Gregg Bluth*

The reviews reinforce the importance of multiple modalities — giving students multiple ways to access information and to express themselves. According to Bluth, “A teacher who attended professional learning about assessments in the revised units said, ‘These assessments give students a voice.’”

Bluth stated, “We also got feedback about differentiated resources, which our teachers really appreciate because it helps ensure all students succeed in their learning. The EQuIP feedback encouraged us to design our materials for that to happen, and now we embed this design principle throughout our work.”



### Consistently Improving Materials

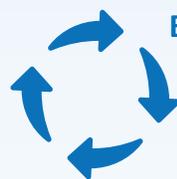
Chris Geerer, a recently-retired teacher who used Mi-STAR materials for five years, said she’s seen that the materials have evolved considerably over time, with an increasing emphasis on making units “student-driven.”

“Assessment products have certainly gotten far more sophisticated,” she says. “The newer units’ more defined assessment structure with cluster scenarios supports students to first look at data, then to extract evidence and select scientific principles they’ve learned, and finally, to pull everything together for sense-making or problem solving.”

According to Geerer, helpful tables provided for teachers show the location of assessment targets throughout the unit. “It may be something like ‘Here’s where you can find the practices in each cluster scenario, and here’s where to find them in the unit.’”

“The tables also help teachers modify assessments in ways that more effectively support students with IEPs\* in demonstrating their learning on assessments,” she says.

“Traditional IEP adaptations cut out questions, especially any that are difficult, but the structure of the tables helps teachers make better decisions,” Geerer says. “Mi-STAR also offers professional learning for this.”



### Bringing Out the Best

About EQuIP feedback, Bluth commented, “We have a kind of love-hate relationship with EQuIP reviews. It’s like when you’re on a sports team with a demanding coach who’s trying to get the best out of you — you hate how hard the drills are, but at the same time you love it because you know the work is taking you to a higher level.”

Bluth continued, “We know the EQuIP rubric and we’ve used it ourselves. At first, we might think we’ve got it right, but then an objective, independent look at it through the review process, without any preconceived notions, gives us that all-important outside perspective to understand whether we have the NGSS design we intended and how our units can improve to support students.”

\*Individualized Education Programs

## About NextGenScience

*NextGenScience*, a project at WestEd, works alongside educators to transform science teaching, learning, and leadership through equitable and evidence-based approaches to reviewing classroom instructional materials, fostering meaningful partnerships, and developing system strategies for coherent science programs. Learn more about our work: [ngs.wested.org](https://ngs.wested.org).