

NGSS Alignment Claims: How Publishers Talk About the Next Generation Science Standards

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Overview

Since the release of the [Next Generation Science Standards \(NGSS\)](#) in 2013, educators have been looking for high-quality instructional materials that will support student instruction toward the goals of the NGSS. In response to this demand, the science instructional materials marketplace has started to fill with products and programs that make different sorts of claims about how they are connected to the NGSS.

For educators, this document will help you to recognize and begin to evaluate common claims.

For publishers and other developers of science instructional materials, this document provides some ideas about how to better communicate the unique aspects of your instructional materials as they relate to the NGSS, and additionally, some ideas about the sorts of claims you might want to make in subsequent versions of your programs.

What is an NGSS Claim?

For the sake of this paper, an “NGSS Claim” is any statement, phrase, or graphical representation made by a developer, author, or publisher of science instructional materials that describes how those materials relate to the NGSS. It could be a tagline to a product, an alignment table or document, a lengthy description, a careful analysis, or some other component of marketing or promotional materials. Clearly, not all claims are equal—some better support an argument for quality than others.

This paper categorizes and describes some of the common ways those developing and marketing science instructional materials are making connections to the NGSS. It does not pass judgement on what are “good” or “bad” claims, but provides examples of various types and suggests questions that when answered could ensure that the claim meets the needs of the teachers and schools making the procurement decision. In addition to sharing the categories of claims common in the marketplace, several examples are provided of claims that Achieve would like to see more frequently—ones that closely tie to the major [NGSS Innovations](#) as described in the [Primary Evaluation of Essential Criteria for NGSS Instructional Materials Design](#) (PEEC).

Common NGSS Claims

Below are descriptions and examples of some of the major categories of NGSS-related claims made in currently available science instructional materials. Note that the promotional materials for a single program often use more than one of these types of claims at a time, and sometimes make claims from all five categories. In each section below, we provide a description of the claim (“What is it?”), share some general examples of what the claims look like along with a couple of specific examples from actual products or marketing material that use this type of claim, and provide some suggestions about what to do to verify the validity of the claims.

As a reminder, these categories are not set up to illustrate “bad” or “good” claims, but to help push the work of educators and publishers so that higher-quality instructional materials become more widely used. It is always wise to be skeptical when selecting instructional materials as they can have a significant impact on instruction. Additionally, the examples shared have not been evaluated to determine whether what they claim is indeed true—only that these claims are made publicly by the publisher or developer of the instructional materials.

Claim Type 1: Buzzwords

What is it?

This type of claim uses buzzwords to make NGSS alignment claims. Some buzzwords, like “inquiry-based” or “minds-on”, were in common use before the [A Framework for K-12 Science Education \(Framework\)](#) and the NGSS and are tied to instruction that might also support the NGSS. Other buzzwords, like “three-dimensional” or “phenomena-based”, have become more common since the NGSS were released. Similarly, some publication promotional materials include claims about “supporting the NGSS” or “supporting NGSS instruction”—basically turning the “NGSS” into a buzzword. All of these terms have meaning and represent critical aspects of science education and could be a part of quality claims, but because these words are used so frequently and in so many different contexts, their meaning has become obscured. Authors and developers should clarify what is meant by these buzzwords and consumers should look for clarification and request it if it is not readily available. If the words are not clearly defined as a part of the

How were these categories of claim types determined?

To generate this list and these descriptions, Achieve identified nearly 300 science instructional materials programs on the market in the summer and fall 2017—full year programs or units—designed to be the primary or core source of instruction. All of the programs reviewed made some sort of claim that they could be used in classrooms that had adopted the Next Generation Science Standards. Some claims are bolder than others; some are better supported by evidence, and some are more appropriate to the NGSS than others.

From this list, we grouped the claims into the categories described herein. Not all claims fit these categories; these represent common or noteworthy claim types, and are more illustrative than exhaustive. No single type of claim should be viewed as inherently bad or good. Claims in all of categories might be used by truly exceptional instructional materials, or they could be used by programs that don’t meet any of the NGSS innovations. This document doesn’t distinguish between truthful and untruthful claims; instead, its purpose is to provide guidance on helping consumers make this distinction.

Example buzzword claims:

“Students will be engaged with **active science** lessons.”

“Students will learn with **inquiry-based** instruction.”

“These instructional materials are **research-based**.”

“The lessons are based on **three-dimensional teaching and learning**.”

“Students engage in **phenomenon-based inquiry**.”

“The units **provide NGSS instruction**.”

claim, they can be used to get a consumer to project their own definition onto the materials. For example, depending on the developer’s definition of inquiry, an “inquiry-based” program may be designed for the NGSS, or it may be something entirely different, e.g., a program that separates the teaching of science “content” from “processes.”

*Specific Examples**

At <https://activatelearning.com/project-based-inquiry-science>, the Project-Based Inquiry Science program is described as “based on research”.

At <http://www.discoveryeducation.com/what-we-offer/techbook-digital-textbooks/science/ngss.cfm>, Discovery Education say that the *Science Techbook* “embraces the philosophy of three-dimensional learning.”

*links for examples were verified in March 2018

Verifying the Claim

As is mentioned above, one of the biggest issues buzzword claims is that they are often used without definition or clarification about what meaning is intended. The word is used and the reader assumes that the marketing team is using the same definition that the reader would use, but there isn’t clarity provided to make sure that’s true. When an undefined buzzword is identified, here are some steps to follow to evaluate the claim:

1. Write down what your definition of the word or phrase should be in a quality claim and describe what evidence of this would look like in quality instructional materials designed for the NGSS. If you’re not sure how NGSS materials should be different, check out [NGSS Innovations and Instructional Materials](#).
2. Ask a publisher or vendor for their definition of the buzzword in question.
3. Ask for examples of specific evidence in the instructional materials that would demonstrate how the instructional materials meet or embody this definition.

Claim Type 2: Authority

What is it?

This type of claim *intentionally connects the development of materials to people or organizations that either have or are perceived to have a connection to the NGSS. Though it makes a lot of sense to involve people that deeply understand the NGSS in the development of materials designed for the NGSS, it is important to know that person’s specific expertise and the degree to which*

Example authority claims:

“NGSS authors are our content experts.”

“The advisory committee for [this product] included [well known scholar], who was on the NGSS writing team.”

they were involved in the development of the materials to understand if this is important. This should be clearly stated in the materials. Just like in science research, claims of authority should be approached with skepticism. It's not who has developed the materials that matters, it's the quality of the materials themselves.

Some publishers have associations with individuals who were part of the writing team for the NGSS or for the *Framework*, who were part of NGSS state leadership teams, who are scientific or educational content experts, or who are media personalities. These individuals are often employed as authors, content contributors, or consultants in the development of instructional materials. Similarly, some publishers have focused on building up content expertise to provide technical support to customers who use their curriculum. When publishers advertise these kinds of associations, their expertise, or the research background of their products, they are not necessarily making direct claims about the content of their materials, but customers might infer that a company with that expertise must have made excellent products that are fully designed for the NGSS. Even if this type of claim is done well, it should be noted that these claims are not about the materials, but rather about features of the developers or publishing company.

*Specific Examples**

At <http://www.pearsonschool.com/index.cfm?locator=PS27Sj>, the page states “Pearson’s close association with the key authors and architects of the NGSS means that the spirit of the initiative is embedded in all we do.”

At <http://www.mheducation.com/prek-12/explore/ngss.html>, McGraw Hill describes their long history in curriculum development, and invites partners to “Let McGraw-Hill Education's expertise in instruction and assessment help you implement the standards smoothly, effectively and successfully.”

*links for examples were verified in March 2018

Verifying the Claim

As is mentioned above, verifying a claim of this type means answering two associated questions:

1. What is the specific, relevant expertise of the person that is referenced?
2. What role did they play in the development of the materials?

Credible claims in this category will provide this evidence without unnecessary searching, but you may have to contact the publisher for specific information. Look for (or ask for) specific information—not just that they were an advisor, but how much of their time was spent advising. Someone in an advisory role may have only provided high level feedback once or twice, or they may have been intricately involved in the materials development process.

Claim Type 3: By Association

What is it?

This type of claim is indirect and implicit, encouraging a consumer to make an inference about the association that a given instructional program has with the NGSS. For example, since the release of the NGSS in 2013, many science instructional materials released in the United States have used a color palate that prominently includes blue, orange, and green—the colors of the NGSS logo—on their promotional materials. Other instructional materials use a logo shape that looks somewhat like the NGSS logo, or make use of the words “Next Generation” in various ways in their promotional materials. These kinds of unstated claims are usually used in conjunction with other claims, and together, help to strengthen the relationship in the consumer’s mind between the NGSS and the instructional materials.

*Specific Examples**

At <https://www.thebiozone.com/>, the three colors used for the three dimensions of the NGSS are used for the three main page links (“Browse Our Products”, “Choose Your Program”, and “Find Your Topic”).

At <https://www.deltaeducation.com/foss/next-generation>, a FOSS instructional material program is named “FOSS Next Generation”.

*links for examples were verified in March 2018

Verifying the Claim

This is not an explicit claim so there may not be anything to verify, but it is important to be aware of psychological effects of packaging. When reviewing materials and looking for explicit claims, pay attention to and document the more subtle claims that are being made. The colors, logos, and similar sorts of implicit claims should be disregarded in selecting materials designed for the NGSS.

If a claim by association is made with words, it’s important to turn that into a question that is then asked to the publisher. For example, if the materials use the claim, “[This product] measures student learning with next gen assessments,” the automatic question to be answered is, “What makes the assessments in this product ‘next gen’?” Answers should be compared to the [NGSS innovations](#) to see if they are really claiming the right things and then verified by examining the evidence. In this case of the example above, this would mean actually reviewing the assessment tasks to see if they match the claim.

Example Claims by Association:

[This product **uses the three NGSS colors** prominently on promotional materials]

“[This product] measures student learning with next gen assessments.”

“[This product] **meets the spirit and intent of the Framework and NGSS.**”

“[This product] **supports the NGSS.**”

“[This product] helps teachers **transition to the NGSS.**”

“[This product] was **built on the same research foundation as was the NGSS and the Framework.**”

Claim Type 4: Alignment/Correlation

What is it?

This type of claim is based on an analysis that compares what is covered in the instructional materials to what is covered by the standards and is often was is being referred to when a set of materials is said to be “aligned to the NGSS.” This has long been typical practice for describing whether instructional materials match up with standards and the NGSS are no exception. Instructional materials often include lists or tables of standards that are related to the content covered by the materials. These lists include an abbreviation for each standard, or each component of each standard, and some checkmark or tally associated with each corresponding lesson, unit, chapter, or section. Following this long-standing tradition, almost all instructional materials that have an explicit claim related to the NGSS include a claim that their materials are correlated in some way or that some or all of the NGSS content is included in the materials.

*Specific Examples**

At http://freyscientific.com/FREY/media/downloads/cpo/curriculum/CPO_Middle_School_NGSS_Correlation_Charts.pdf, Frey lists correlations between the NGSS and chapters in instructional materials.

At <http://carbontime.bsos.org/about>, Michigan State University says that the units, lessons, and activities are “aligned with NGSS practices, crosscutting concepts, and disciplinary core ideas.”

*links for examples were verified in March 2018

Verifying the Claim

The quality of this claim lies both in what is meant by alignment or correlation and what assumptions are made based on alignment. In evaluating an NGSS alignment/correlation claim, there are three important considerations, each which should be answered positively to support the claim.

1. Does the claim include a description of correlation with all three dimensions of the standards?
2. Is there information at the grade-appropriate element level for each of the dimensions?

For example, if the materials only indicate where the crosscutting concept Cause and Effect is addressed in their materials without providing more detail about the grade-banded elements of Cause and Effect found in [Appendix G](#), that would not be sufficient to even claim correlation.

3. Does the student learning referenced in the materials match the learning that is claimed?

Example Correlation Claims:

“[Our product] is **aligned** to the NGSS.”

“[Our product] **correlates** with the NGSS.”

“This program **covers all three-dimensions.**”

“The **crosscutting concepts are represented** in the lessons.”

“The **science and engineering practices are integrated throughout** the curriculum.”

Just because it is claimed, doesn't mean it's true. At least spot check several of the claimed connections to the standards to verify to what degree the materials address the parts of the standards claimed.

Finally, because the NGSS expect three-dimensional student performances that position students to be making sense of phenomena and designing solutions to problems, it is important to highlight that just having the bits and pieces of the standards is not sufficient for a product to be considered designed for the NGSS. This is especially true if those charts only list full NGSS performance expectations (which are intended for the end of the grade level) rather than the three-dimensional expectation for what students should be doing at the lesson level; or if the charts list only category names for practices and crosscutting concepts (e.g., "Asking Questions") rather than specific practice or crosscutting concept elements (see NGSS Appendices [F](#) & [G](#)).

Claim Type 5: Designed For the NGSS

What is it?

This type of claim often echoes language from NGSS documents that describe how different the NGSS is from previous sets of standards, therefore requiring instructional materials to be crafted *for* the NGSS—not just resequencing existing materials to make them aligned *to* the NGSS. An increasingly common way that publishers are making this kind of claim is to showcase an analysis done on their materials using the [EQuIP](#) (Educators Evaluating the Effectiveness of Instructional Materials) suite of tools.

*Specific Examples**

At <https://www.carolina.com/stem-science-technology-engineering-math-curriculum/smithsonians-stcms-curriculum/27701.ct>, Carolina Biological describes a curriculum program as going "beyond meeting the NGSS standards" and that it "steps up to the challenge of meeting the 5 innovations of NGSS."

At <http://blog.eie.org/see-how-eie-aligns-to-ngss-with-equip-rubrics>, Engineering is Elementary states that the instructional materials "score high on all counts" when using an EQuIP rubric.

*links for examples were verified in March 2018

Verifying the Claim

While we hope that more and more publishers and authors would make claims of this type, it is important to remember that it is still just a claim and needs to be verified. To verify the claim, educators should do the following.

For all designed for the NGSS claims:

1. Ask for a description of how the materials were designed for the NGSS.

Example Designed for NGSS Claims:

"When evaluated on the **EQuIP rubric**, [this product] gets a **high score**."

"[This product] **fulfills 100% of the NGSS**."

"[This product] **meets the NGSS innovations**."

"[This product was] **written from scratch** for the NGSS."

2. Compare the description to the [NGSS Innovations](#) to make sure they line up with the intent of the standards
3. Verify that the materials match up with the claim.

If a claim includes EQulP Rubric for Science evaluations:

1. Verify that the person or organization doing the review has documented expertise in using the rubric;
2. Make sure that the completed rubric is included as evidence; and
3. Confirm that the evidence provided is comparable to the evidence provided by Achieve’s [Science Peer Review Panel](#) along with the [high quality examples](#) they have identified.

What might better claims look like?

When science educators and curriculum coordinators examine the claims made by those marketing instructional materials, they are frequently seeking evidence that the materials are designed for the NGSS. The previous sections outline some common categories of claims currently in the marketplace, but to help educators think about what claims connected to what is new and different in the NGSS and to help publishers focus on developing and marketing materials that are designed for these innovations, this section helps to define what NGSS design looks like in instructional materials, and what claims might look like if they focused on the things that make the NGSS new and different from past standards and discusses how those innovations manifest themselves in instructional materials.

In the section below, for each of these [NGSS Innovations](#), a short description of the innovation is followed by one or more examples of what an claims might look like that more directly addresses the innovations, along with some ideas about what quality evidence would look like to verify that claim.

Innovation 1: Making Sense of Phenomena and Designing Solutions to Problems

Making sense of phenomena and/or designing solutions to problems is the central context for student work, and drives student learning.

Example claim: “Making sense of phenomena drives student learning.”

Example evidence: Instructional materials are organized so that student activity focuses on a series of phenomena and/or problems, and that student learning comes from sequential and substantive engagement in the questions, conditions, and situations that emerge from these experiences. These are not just engagement hooks or enrichment activities and they are not cookbook-type labs confirming ideas in a text, rather they are the core of the student learning experience. Support is given to teachers to guide students through series of phenomena and problems as they engage in three-dimensional learning.

Innovation 2: Three-Dimensional Learning

Student engagement in making sense of phenomena and designing solutions to problems requires student performances that include and connect grade-appropriate elements of the Science and Engineering

Practices (SEPs), Crosscutting Concepts (CCCs), and Disciplinary Core Ideas (DCIs) in instruction and assessment.

Example claim: We not only have the pieces of the NGSS, our materials integrate the three dimensions in student performances.

Example evidence: The three dimensions of the standards are not taught in completely independent areas in these instructional materials. In all units, all three dimensions are used extensively and in roughly equal priority. In many lessons and student tasks, all three dimensions are referenced and leveraged for students.

The focus of student learning in these instructional materials—both instruction and assessment of learning—is on student performances that integrate all three dimensions of the NGSS.

Innovation 3: Building K–12 Progressions

Students’ phenomena and three-dimensional learning experiences are designed and coordinated over time to ensure students build their understanding and application of all three dimensions of the standards.

Example claim: [The product] builds all three dimensions of the NGSS.

Example evidence: The instructional materials provides maps on pages XV-XX lay out the elements of each dimension and how they are addressed in each unit of each grade. These maps describe how [the product] was designed to ensure that students have multiple opportunities to advance their understanding of each element of each dimension over time, and that their opportunities to do so get more sophisticated over the course of the year.

Example claim: Engineering and the nature of science are embedded in [the product].

Example evidence: Engineering Design and the Nature of Science are distinct and prioritized learning goals that are interwoven into the student learning experience. The materials included features designed so that both students and teachers can identify where Engineering DCIs and SEPs, and Nature of Science learning goals are embedded. This is mapped out in the teacher materials and the features are interwoven into student learning experiences and not set apart for separate learning time.

Innovation 4: Alignment with English Language Arts and Mathematics

Students engage in learning experiences with explicit connections to and alignment with English language arts (ELA) and mathematics standards.

Example claim: [The product] helps build student math and ELA skills.

Example evidence: The program explicitly and intentionally makes natural connections to mathematics and English language arts learning in grade-appropriate and substantive ways that help build broad and deep conceptual understanding in all three subject areas. For instance, when students do data collection as part of an investigation, teachers are guided to intentionally build on graphing and statistics techniques

from mathematics to make sense of this data. Similarly, when students use background readings to gather information for their science investigations, literacy tools are provided to help students recognize the importance of determining an author's point of view in science writing.

Innovation 5: All Standards, All Students

All students have equitable access and opportunity to learn with science instructional materials.

Example claim: [The product] is carefully designed to support learning for students not traditionally well-represented in science fields.

Example evidence: The units are built to be flexible for all kinds of learners, providing frequent guides to teachers to help them adapt the lesson to their own students' needs. In addition, the units are focused on student motivation; consistently cultivating student questions and making sure that students feel that their questions are driving the learning experience. All units have embedded opportunities for students to demonstrate their understandings and abilities in a variety of ways, including some that don't rely on English speaking or writing skills.

Conclusion

Science instructional materials are a critical component for improving science education outcomes for students nationwide. With the release of the *Framework* and Next Generation Science Standards in 2013, the science education field provided a clear vision for science teaching, learning, and leading into the next decade. As curriculum developers and publishers continue to develop and revise their products for these new standards, it's important for educators to learn more about the NGSS-related claims made in promotional materials and to make informed purchasing decisions.

Claims about the relationship between the NGSS and any particular instructional program may or may not be focusing in on what is truly new and different in the standards as clarified in the NGSS Innovations and they may or not be accurate. Evaluating the evidence behind the claims, as well as the overall NGSS design of the instructional materials, is essential. Tools such as the [EQuIP Rubric for Science](#) and [PEEC](#) should be used to help ensure that the instructional materials chosen for classrooms use will live up to their claims.