

Ryan Kaiser
Standards Analysis

I am a second grade teacher so I am using the Common Core standards in math for second grade and looking at the NGSS standards and technology standards within the K-2 band for comparison. Looking at the technology standards, the strongest connection is in the design, abilities for a technological world, and the designed world chapters. In these chapters students are using technology to solve problems and understanding how to use technology to create new programs or tools to become more efficient in different areas of the world. In the math standards students use their knowledge of operations, math facts, and problem solving skills to answer word problems, represent their thinking using models and explaining the math concepts they used in solving the math problems. Having a solid base of these skills allows students to take on challenging authentic word problems and use their math reasoning and skills to not only solve the problems and represent their thinking but also to explain the reasons behind their solutions. Students can use their learning from the measurement and data standards as a part of the design process when creating and designing to help them to plan and construct as well as providing data feedback. Many of the NGSS standards were designed with the idea of engineering and problem solving in mind and are written as performance standards and expectations as a result. These standards have students being by planning investigations to observe, identify, and learn about the different areas (matter, biological diversity, earth changes, etc) and begin to understand the principles, properties, and situations. The students will then use this background knowledge for the latter part of the standards where they are required to plan, develop, create, and design using their newly gained knowledge to solve authentic problems or develop models to explain and demonstrate concepts that they have explored.

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These standards are similar in their structure by having students beginning by exploring and understanding the background knowledge necessary to apply their knowledge and problem solving skills to the design process. In all three areas students explore by observing, discovering and manipulating to understand how numbers, materials, or technology works to identify possible purposes or uses so that when they are met with a challenge or task they are able to transfer their knowledge to a new situation and combine various areas of their learning together to problem solve and design as necessary to accomplish the task.

The standards are different in the way that the standards are assessed. The math standards are written and assessed primarily by students performing a math related task, or solving questions to show that they understand a math concept. The technology and NGSS standards are written in a more explorative and task-oriented way where students are not learning to follow a process to solve for an answer but discover and look for applicable uses for their newly gained knowledge through investigations, experiments, and opportunities to design and plan for an authentic task such as creating models or comparing engineering solutions for effectiveness.

I believe that using the engineering design problem solving process is a great opportunity for students to gather knowledge from across different domains and bring it together to think critically about how to use their knowledge and skills to plan, design, and create something to fit a set of criteria and solve a problem. It gives them an opportunity to see that their math skills and technology use has a place in the real world to solve authentic problems outside of the classroom and can be applied in a variety of ways and situations. To me, using the design

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process allows students to transfer their knowledge which is the ultimate sign of understanding the content they are learning and the application of new skills.