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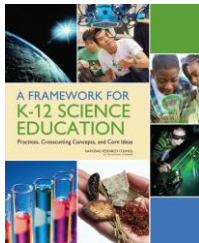
## Reference List of Academic Standards

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The MISF STEM Advisory Committee encourages schools to incorporate Science & Engineering Practices and Crosscutting Concepts, as applicable, from *A Framework for K-12 Science Education*, the foundation on which the Next Generation Science Standards (NGSS) were built.

The *Framework* recommends that science education in grades K-12 be built around three key dimensions:

1. **Scientific & Engineering Practices**, including asking questions, defining problems, using mathematics, developing models, etc.
2. **Crosscutting Concepts** that unify the study of science and engineering, including patterns, cause and effect, scale, proportion and quantity, etc.
3. **Disciplinary Core Ideas** from the following four areas: physical sciences; life sciences; earth and space sciences; and engineering, technology, and applications of science.



*A Framework for K-12 Science Education*, published by the National Research Council (2012), is available for download at:

[www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts](http://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts)

*The Next Generation Science Standards (NGSS)* are available at:

[www.nextgenscience.org](http://www.nextgenscience.org)

Science & Engineering practices:

[http://nstahosted.org/pdfs/ngss/resources/201112\\_framework-bybee.pdf](http://nstahosted.org/pdfs/ngss/resources/201112_framework-bybee.pdf)

Crosscutting Concepts:

<http://nstahosted.org/pdfs/ngss/MatrixOfCrosscuttingConcepts.pdf>

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The **Minnesota Academic Standards for Mathematics** (2007) and the **Minnesota Academic Standards for Science** (2009) and supporting information can be found on the SciMathMN Minnesota STEM Teacher Center website: [www.scimathmn.org/stemtc/standards](http://www.scimathmn.org/stemtc/standards).

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**The International Technology and Engineering Educators Association (ITEEA) Standards for Technological Literacy: Content for the Study of Technology** are available at:

<https://www.iteea.org/Publications/StandardsOverview.aspx>

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The **Framework for 21st Century Learning** defines skills and knowledge students need to succeed in work, life and citizenship. See <http://www.p21.org/about-us/p21-framework>.