



STEM Education




Science and Engineering Notebooks
Grades K-5

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What is STEM?

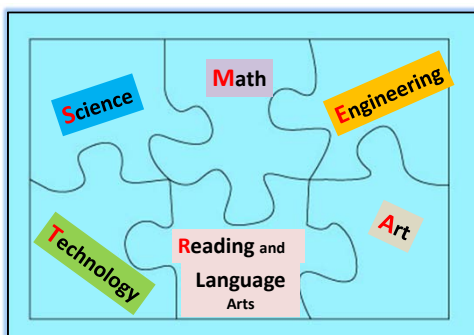
Science
 Technology
 Engineering
 Mathematics



“STEM Education seeks to increase access to learning by preparing students for post-secondary study, the 21st century workforce, and becoming informed citizens.”
 -Wesson 2013



STEM is *integrated learning*.



NGSS Eight Scientific and Engineering Practices

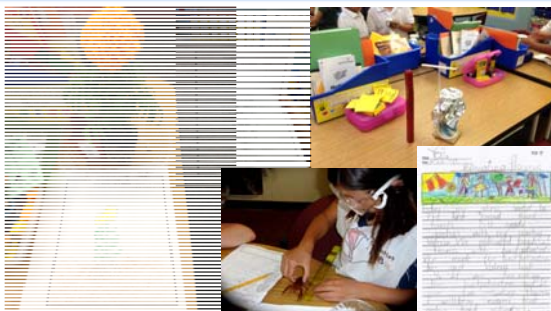
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Science and Engineering notebooks support **STEM** and **NGSS**.

Notebooks provide a platform for speaking, reading, and writing that supports:

- ❖ Evidence based inquiry
- ❖ Engaging activities
- ❖ Integrated learning across disciplines
- ❖ Problem Solving that promotes deep thinking
- ❖ Powerful and thoughtful observation skills
- ❖ Real world connections
- ❖ Data collection and analysis
- ❖ Academic vocabulary
- ❖ Formative assessments for teaching and learning
- ❖ 21st Century Skills

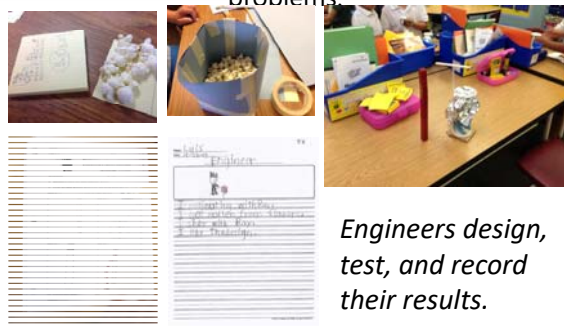
Scientists using notebooks integrate, math, writing, science, reading, and art.



Scientists collaboratively use notebooks to integrate speaking, critical thinking, and science.

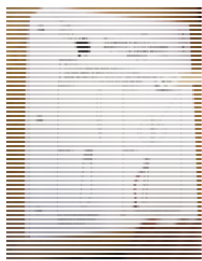
Scientists share their results with each other.

Engineers using notebooks integrate engineering, math, science, art, reading, and writing when designing solutions to real world problems.



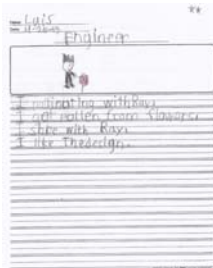
Engineers design, test, and record their results.

Engineers test their best designs and enter the results in their notebooks.



Engineers apply their knowledge of science to solve real problems.

Scientists and engineers use notebooks to write about their investigations and designs.

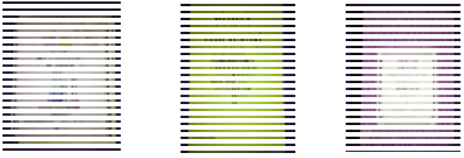


Science and engineering gives students real reasons to write.

Scientists and engineers use the information in their notebooks to present their findings.

Engineers and scientists practice their presentations.

How do I make a notebook?



1. Use composition books, spiral notebooks, or make a packet.
2. Include the following:
 - Cover Page
 - Title Page
 - Table of Contents
 - Numbered Pages (volunteers can do this)

Activity – Make a Notebook

❖ Water Tension Experiment
