

ST1.5 Demonstrating STEM learning

- Preschool - Preschool students are learning through trial and error; investigating, predicting and making changes. The preschool staff encourages conversations about what worked and what didn't work during play.
- Kindergarten: Kindergarten students follow the Engineering Design Process through verbal discussions of what worked/didn't work. The children problem solve through the exploration process and are able to communicate results through pictures/labels.
- First Grade: The students share their results about how things worked out through discussions and write-ups.
- Second Grade: Students learn about air and weather, then participate in planning and creating kites and parachutes through STEM activities. Students then test, and compare and contrast results. Students also demonstrate learning of maps through Flat Stanley projects, they research and create presentations about inventions from Asia, and demonstrate understanding of Native American beliefs by designing related artifacts.
- Third Grade: Third grade students demonstrate their learning through performance based assessments such as lab reports. For example, students explore the inquiry process through hands on experiments facilitated by teachers but run by students. Students share their conclusions with the class including whether their conclusions support their original hypothesis. In math students solve word problems using drawings, equations, and words to explain their thinking. They are asked to explain how they know their answers are reasonable and what their drawings represent. Another example would be students' exploration of rocks and minerals. Students work collaboratively to sort various rock samples. They could choose from a scratch test, a test in a solution, and other tests. They would discuss their findings with each other and explain how they knew how to sort them. Another application of performance based assessments are presentations. In the "Future of Agriculture" problem-based learning project students completed a problem-based learning project that culminated in a presentation of their research, plan, and design. Students solved a real-world problem through conducting research, designing a model, and then choosing a method of presenting (performance-based assessments). Students could choose from options like a proposal to the Agricultural Committee, a newscast, an advertisement, a radio segment, or a newspaper article. Students also created the rubric by which they would be evaluated which included elements of their content, research, design, and presentation.
- Fourth Grade: 4th grade students demonstrate their learning through performance-based assessments and express their conclusions through elaborated explanations of their thinking by participating in scientific method and engineering design process while performing experiments with the use of the FOSS kits. Students are expected to derive a conclusion at the end of each experiment that should allow them to generate more testable questions based on the subject matter they are experimenting with. Students are also expected to reflect their thinking after the conclusion of each STEM related activity. These conclusions are often a written reflection, but can also be a video, website, or PowerPoint presentation.
- Fifth Grade- Students are exposed through performance-based labs throughout each unit in order to assess if they are able to conduct a lab using their knowledge of the scientific method and engineering process. Students are assessed through multiple performance records; checklists. Conclusions are separately graded and are given its own rubric to ensure students have fully reflected upon their lesson. Students are given performance based tasks; i.e. place value discs in order to show movement of the numbers into the difference/corresponding columns. They are able to demonstrate their knowledge of regrouping by showing the movement of the discs throughout the columns.
- Sixth Grade: Students have multiple opportunities across the content areas to demonstrate their understanding of concepts by performing labs, presenting projects, re-creating inventions, and producing simulations of real-world historical and current events.
- Seventh Grade - Students have multiple opportunities to clarify, elaborate on, and defend their thinking and conclusions using verbal, symbolic, and visual means by presenting their inventions on STEM night, where they participate in the inquiry process to create and test an invention. Students present their inventions in class to their peers and display them on STEM night for community members, parents, and stakeholders to view. Students demonstrate their learning through performance-based assessments by taking pre and post tests on STEM days. All 7th grade teachers also give pre and post tests for each unit of study to show knowledge growth.
- Eighth Grade: All students demonstrate their understanding of STEM investigations through discussion, hands-on engineering and problem-solving, and completing a writing assignment. All students create an Engineering

Expo project to be exhibited on STEM Night. All students use dialogue, assessments, classwork and hands-on science experiments to demonstrate their understanding.

- Special Areas: Self and peer analysis, critique of fitness activities, art activities i.e. judging, art critic. Students incorporate an artistic style and apply that style to their own personal history for self-expression. Students regularly assess the components of the art form/style and provide evidence for the evaluations.
- Ren 6/7/8: The final synopsis of problem-based and project-based learning constitute a large portion of assessments of skills and standards. Each student is familiar with and able to utilize and create rubrics to measure their learning across content areas. Production of models, demonstrations, graphic resources are some forms of performance-based assessments.