

Math Midway 2 Go and the Common Core State Standards

The exhibits and activities at *Math Midway 2 Go* (MM2GO) are designed and created to quickly engage learners in doing, in thinking about, and in understanding mathematics. The exhibits stimulate inquiry, spark curiosity, and foster precisely the mathematical practices that the new Common Core State Standards (CCSS) are advocating for learning mathematics.

MM2GO activities are exploratory, hands-on, interactive, and open ended. Interaction with the exhibits provides rich opportunities for all students to develop those important processes and proficiencies articulated in both CCSS and National Council of Teachers of Mathematics (NCTM) Standards. By exciting student curiosity and creating enthusiasm these activities foster and cultivate behaviors of practicing mathematicians and scientists. Quickly captivating both body and mind, MM2GO present experiences, puzzles, surprises, and problems that itch for explanation. The exhibits further encourage sense-making and nurture perseverance in trying to resolve situations or solve problems. Many exhibits require abstract and/or quantitative reasoning, constructing and sharing, and then critiquing arguments. The activities involve participants in mathematical modeling, using appropriate tools, attending to precision, looking for and using structure, and finding regularity and patterns in repeated reasoning.

Briefly, here is how some of the MM2GO activities foster the Mathematics Practices advocated in the CCSS:

CCSS asks math educators at all levels to help students become mathematically proficient. This means, the Standards say, that students not only make sense of problems but persevere in solving them. Almost all the activities within MM2GO will involve your students in problem solving in ways that keep them engaged until they've succeeded. Students will examine a given symbol on the Number Line Tightrope over and over again because they know at a gut level that they will solve it eventually... and they do.

While at Roller Graphicoaster, students design the fastest possible roller-coaster. Students model this real-life situation with mathematics and then use quantitative reasoning to race the roller-coaster to the finish line. The Organ Function Grinder offers the opportunity for more abstract reasoning as students create functions that will transform a given input into a desired output.

The MM2GO exhibits encourage social interaction that fosters meaningful mathematical discussion among students. Miles of Tiles and Funny Face encourage social interaction, friendly argument, and listening and giving feedback to the hypotheses of others. In this way, the students develop critical thinking skills.

To model with mathematics means to find mathematical meaning beneath the surface of a problem situation, examine and manipulate the problem to find an abstract solution, and at the same time apply that solution to a given situation. Roller Graphicoaster encourages such practice. Students seek and find ways to move the roller-coaster even faster and represent their solutions with equations.

Different exhibits offer multitudes of mathematical tools to use in strategic manners. From the manipulatives of Miles of Tiles where learners study and create their own tessellations to the calculators of the Organ Function Grinder to the various mirrors of Funny Face, students work with math tools as they solve problems.

Students appreciate that attending to precision is important in several exhibits where small perturbations can affect results, even cause large distortions. Roller Graphicoaster is an exhibit that relates to this mathematical practice.

Looking for patterns and structure is an important mathematical practice. Several exhibits underscore this behavior, including Number Line Tightrope and Ring of Fire. As important as seeing pattern and structure is seeing regularity and repetition in thought processes. Some of the exhibits involve evaluating and improving intermediate results. Opportunities for this type of mathematical thinking abound in MM2GO.

These mathematical practices encourage mathematical proficiency. Each of the exhibits of MM2GO is also associated with one or more mathematical content area(s). The exhibits are designed to permit access at many different levels of sophistication. Topics including counting and cardinality, number and operations, algebraic reasoning, measurement, data, geometry, proportionality, and probability are addressed in the exhibits in an enjoyable and immersive way. Creative teachers can find many ways to link the exhibits of MM2GO to their units of study, from 7th grade study of cross-sections with the Ring of Fire to high school study of functions with the Organ Function Grinder or Roller Graphicoaster.