The REMS Program uses real-world scenarios to make math and science fun and meaningful for students in grades 5-12. Activities are designed to provide improved understanding and retention of mathematical and scientific concepts through the use of engineering practices.

The curriculum options include nine online lesson plans and interactive activities themed to examine three pressing challenges in the US: preserving sustainable, competitive manufacturing; distributing products and services across the world; and developing and delivering efficient health care services. Each of the lesson plans provides age-appropriate math and science curriculum that tie to the Common Core Learning Standards for elementary, middle and high school students.

PROGRAM GOALS
1. Create an effective math and science curriculum for grades 5-12 with a hands-on engineering focus.
2. Increase number of 5th – 12th grade math and science educators using age-appropriate activities linking math and science to real-world engineering challenges.
3. Increase the number of students who have access to fun, age-appropriate hands-on activities that link math and science to real world problems.

WHY USE REMS LESSON PLANS TO TEACH K-12 ENGINEERING?

- **Learning through Experience** - Children learn through experiences, and the earlier we create STEM-based experiences, the better. Engineering builds upon knowledge of science and math – with its impact reaching far beyond!
- **Enhance Scientific and Mathematical Literacy** - Use of the REMS lessons and activities engages students in some everyday applications of science and mathematics to improve their understanding of fundamental, and often complex concepts, in a way that makes sense to them.
- **Not an Engineer? Not a Problem!** - Engineering is all around us. REMS lessons use engineering concepts to integrate known math and science fundamentals through a variety of activities.
- **Not a Computer Whiz? Not a Problem!** - Lessons are a freely-accessible, user-friendly environment for K-12 teachers and engineering educators. All you need is an internet-capable computer. The lessons and activities contain consistent components, so once you become familiar with one lesson, you understand the structure of the other lesson plans.
K-12 Engineering Activities to Support  
Math and Science Learning, Creativity, & Innovative Thinking

**CONTEMPORARY MANUFACTURING**

**CYCLE TIME**  
Assemble a skateboard on an assembly line and learn about the concept of cycle time. See skateboards built on an assembly line via videos and animations/simulations. Students experience the basic steps of the manufacturing, or assembly process and will gain an appreciation for how changing or redesigning the work can impact the cycle time.  
*Duration: 30-50 min.*  
*Curricular Topics Include:* Averaging and Comparing Numbers, Collecting and Analyzing Data, Percent Increase/Decrease, Equation Writing

**LINE BALANCING**  
Experience the process of balancing an assembly line, using videos and simulations of skateboards being manufactured. Students learn how changing the work being done at each workstation or changing the number of people working can impact the flow of the assembly line.  
*Duration: 45 min.*  
*Curricular Topics Include:* Averaging and Comparing Numbers, Collecting and Analyzing Data, Percent, Bar Graphs, Normal Distribution, Extrapolation, Hypothesis Testing, Drawing Conclusions, Cost Analysis

**PERFORMANCE TESTING**  
Study the conversion of potential energy to kinetic energy and the relationship that connects the variables. Data from releasing a skateboard on a ramp is used to demonstrate this conversion of energy and provide insights into the conservation of energy.  
*Duration: 45 min.*  
*Curricular Topics Include:* Linear Equations-Graphing and Computing, Problem Solving, Conservation and Conversion of Energy, Friction, Hypothesis Testing, Collecting and Analyzing Data, Drawing Conclusions, Functions, Interpolation

**DISTRIBUTION AND LOGISTICS**

**MEAL PICKING**  
Under Construction

**ERGONOMIC DESIGN**  
Learn the concept of ergonomics and process of designing products to accommodate physical limitations of the human body. Students perform anthropometric measurements as part of an ergonomics assessment used to design systems so people can safely, comfortably, and easily use the systems.  
*Duration: 45 min.*  
*Curricular Topics Include:* Collecting and Analyzing Data, Comparing Numbers, Statistics-Mean, Median, Mode, Quartiles, Standard Deviation

**HOUSEHOLD CONTAINER RECYCLING**  
Under Construction

**HEALTHCARE**

**PATIENT FLOW**  
Concept currently being designed is a core element of the problem solving process called “root cause analysis”. Students will simulate a visit to the doctor’s office, collect data in regards to patient wait time, and brainstorm ideas to make the flow of patients smoother and therefore quicker.  
*Curricular Topics Include:* Problem Solving, Rates, Fractions, Ratios, Formulating Hypotheses, Converting Units of Measure, Probability

**ERGONOMIC PACKING**  
Under Construction

**HAZMAT DISPOSAL**  
Under Construction

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