Helping Today's Students Become Tomorrow's Engineers and Scientists

SAE International's A World In Motion® (AWIM) is a teacher-administered, industry volunteer-assisted program that brings science, technology, engineering and math (STEM) education to life in the classroom for students in Kindergarten through Grade 12. Benchmarked to the national standards, AWIM incorporates the laws of physics, motion, flight and electronics into age-appropriate hands on activities that reinforce classroom STEM curriculum.

Through the support of corporations, foundations, volunteers, SAE members and the SAE Foundation, A World In Motion opens a window of possibilities for students as they discover the exciting application of science principles and learn about rewarding engineering, science and technical careers. The students learn to work as a team with their classmates and apply creative problem solving during the activities.

The A World In Motion program builds bridges between corporations and classrooms by giving teachers, volunteers, and students the opportunity to work together and learn from each other.

Industry support is essential to this program. Corporations and their employees can influence the ways in which youth are prepared to meet the future by sponsoring schools in their communities. By doing so, schools can qualify to receive free or low cost AWIM Challenge kits. Volunteering for AWIM is a great way to serve as a steward for your chosen profession.

Since 1990:

- Over 4 million students have participated in the AWIM program in all 50 U.S. states and 10 of 13 Canadian provinces and territories
- More than 65,000 activity kits have been provided to teachers and volunteers
- Over 20,000 engineers, scientists and technology professionals have volunteered in partnership with the A World In Motion program

A World In Motion Challenges

NEW!

Primary Level (grades K-3)

- **Rolling Things Challenge**
  Students explore the story, *The Three Little Pigs Sledding Adventure*. Based on the scientific concepts presented in the story, students explore toy cars and car performance. Students launch the cars from ramps and investigate the effects that different ramp heights and car weights have on distance traveled. Students make adjustments for performance through variable testing.

- **Pinball Designers Challenge**
  Students explore the concept of optimizing a design by designing and building a pinball game. The story of *Malarkey & the Big Trap* introduces students to the concept of improving a design through experimentation and data analysis. Students test the launch ramp to explore how launch position affects the behavior of the pinball. Students make their games more challenging by adding targets, walls, and bumpers to the game board.

- **Engineering Inspired By Nature**
  Students investigate methods in which seeds are dispersed in nature through the story, *Once Upon a Time in the Woods*. The story leads the students to further explore seeds dispersed by the wind. Students use the designs of nature to develop paper helicopters and parachutes and perform variable testing to improve performance.

- **Straw Rockets Challenge**
  Students explore the early life of Dr. Robert Goddard through the age appropriate biography, *The Rocket Age Takes Off*. Investigating Goddard's early trials and tribulations to create the first liquid fueled rocket engine, students begin to uncover the work necessary to optimize a design. Students use a design process to build and perform variable testing on straw rockets. Design goals include farthest and highest flight.

Elementary Level (grades 4-6)

- **Skimmer Challenge**
  Students construct paper sailboats and test the effects of different sail shapes, sizes, and construction methods to meet specific performance criteria. Friction, forces, the effect of surface area and design are some of the physical phenomena students encounter in this challenge.

- **JetToy Challenge**
  Students make balloon-powered toy cars that meet specific performance criteria: distance traveled, weight carried, accurate performance, and speed. Jet propulsion, friction, air resistance, and design are the core scientific concepts students explore in this challenge.

- **Gravity Cruiser Challenge**
  Students focus on understanding the relationships between the “sweep” of the lever arm, the number of winds the string makes around the axle, and the distance the gravity cruiser travels. They also investigate how the diameter of the wheels, the diameter of the axles, and the amount of weight placed on the lever affect the gravity cruiser’s speed and distance. This challenge introduces a rich activity in critical thinking and learning how to use the experimental method to test hypotheses and solve an engineering problem.

Middle School (grades 6-8)

- **Gravity Cruiser Challenge**
  Students focus on understanding the relationships between the “sweep” of the lever arm, the number of winds the string makes around the axle, and the distance the gravity cruiser travels. They also investigate how the diameter of the wheels, the diameter of the axles, and the amount of weight placed on the lever affect the gravity cruiser’s speed and distance. This challenge introduces a rich activity in critical thinking and learning how to use the experimental method to test hypotheses and solve an engineering problem..

- **Motorized Toy Car Challenge**
  Students develop new designs for electric gear driven toys. To meet a specific set of design requirements, students must write proposals, draw sketches, and work with models to develop a plan. Force and friction, simple machines, levers and gears, torque and design are core concepts covered.

- **Glider Challenge**
  Students explore the relationship between force and motion and the effects of weight and lift on a glider. The glider activity culminates in a book-signing event where each design team presents its prototype and the class presents its manuscript of Glider designs. Students learn the importance of understanding consumer demands and the relationships between data analysis and variable manipulations.

- **Fuel Cell Challenge**
  SStudent teams design a toy car that uses a PEM (Proton Exchange Membrane) fuel cell to power the electric motor. Elements of electrical currents, Green Design, and transformations of energy are explored as the teams develop their product.

To learn more about this award-winning program, or for assistance in your search for an industry volunteer, contact:

SAE International

1-800-457-2946
awim@sae.org · www.awim.org

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