MAGNETIC LEVITATION (MAGLEV)

Core Outcomes -

Students will understand and be able to state the Universal law of Gravity and demonstrate an understanding of it; and define and demonstrate what magnetic "attraction" and magnetic "repulsion" is. Students will be able to explain what a "magnetic field" is, and relate it to magnets, as well as maglev vehicles and a maglev track. Students will describe at least three benefits of the use of maglev vs. diesel trains. Students will also be able to demonstrate an understanding of open and closed electrical circuitry if participating in the electric maglev event. Students will explain what the term "maglev" means, and demonstrate an understanding of how magnetic levitation occurs.

Challenge:

Using prefabricated CPEP kits, students are challenged to design, construct, evaluate, test and enter a MAGLEV vehicle in the CPEP Day competition.

Rules: Each student team will build a MAGLEV vehicle using the kits provided by CPEP. Each kit will contain the following items and each kit can be adapted to construct each of the MAGLEV categories.

- The appropriate power source
- A styrofoam block to be used as the vehicle body
- Plastic "J" channels & "U" channel
- Rubber bands
- Propellers
- Electric motors

Each school will be provided a 5-foot MAGLEV test track for trial runs. A ten-foot long track will be used during the CPEP Day competition.

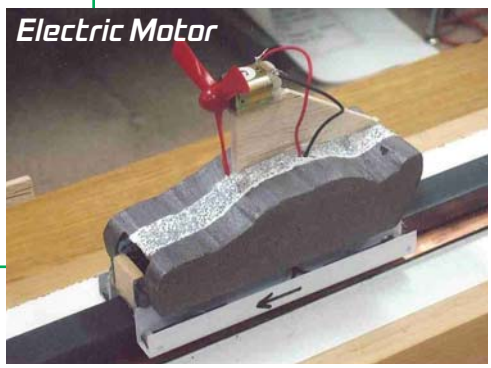
MAGLEV Categories

• Gravity • Wind • Propeller • Electric Motor

We suggest that students start with building Gravity or Wind powered MAGLEV vehicles.

Rules:

Gravity Powered Maglev: Students can use their creativity to test various designs that include an analysis of varying weights.



Wind Powered Maglev: The sail for the vehicle can be made of any material like such as wood, cloth, cardboard, paper, sheet metal, etc. The car can only be equipped with one sail and the sail cannot exceed 12" x 12". A 20-inch fan will be used to power the vehicle at CPEP Day.

Propeller-Rubber Band Maglev: Sails or wings are not permitted when building the Propeller MAGLEV.

Electric Motor Maglev: Students are permitted to use a 12 volt power source to supply electricity to the test track.

Judging and Scoring:

Each team will be allowed two trial runs for each category of MAGLEV vehicle. Electronic timers will be used to determine the fastest trial for each team. The team with the fastest time will be deemed the winner of the MAGLEV event in each category.

Prototype Maglev - An award will be given for the prototype Maglev project that uses the same design specifications mentioned previously but incorporates environmentally sensitive materials as well.