Maglev Train, for HS sites

BEAM Fall 2011
Contact: Robert Chen
Last modified: 11/7/11

Lesson Overview:
Using a pre-built Maglev train track, allow students to experiment building magnetically-levitating trains.

Introduction - 10 min
How do magnets work? Do N and S repel or attract?
Has anybody heard of a Magnetic levitating train, say in Japan or Europe, before?

Explain the challenge - 2 min
The goal is to build a Maglev train with a "sail" that will travel the farthest down the track while being powered by the lungs.

Build and Test the Trains - 30 min
Give mentees plenty of time to test and improve their designs via trial and error.

Competition - 10 min
Whoever can make his/her train travel the farthest with their breaths wins.

Materials for Maglev track
- Plank of wood, 1" thick x 6" wide x 6' long
- Two pieces of clear acrylic plastic siding, 6" tall x 6' long
- Many bar magnets
- Wood glue or hot glue gun
- Wood screws
- Washers

Materials for Maglev train
- Cardboard or poster board or balsa wood
- 4 or more bar or flat magnets
- Masking Tape

Procedure for making the track
1. On the plank of wood, glue the plastic siding on the sides of the wood as a preliminary securing measure
2. Screw the plastic siding in with washers for added stability
3. Glue down the bar magnets along the side of the plank of wood, next to the plastic siding.
4. While making the track, it is important that the two sides of the track both have the same orientation

Procedure for making and testing the train
1. Test the magnets and arrange them so that the bottom repels the track.
2. Tape the magnets onto a platform cut in order to prevent lateral tipping but minimize friction.
3. Add a sail to catch the breath.
4. Allow students to test and improve their trains.