



## TEACHER TIPS DESIGNING MAGLEV SYSTEMS

### LESSON 2- STEERING CLEAR OF DANGER

- Have students take 2 – 3 minutes and practice their driving skills on the model intersection prior to beginning the formal lesson.
- Take time during that practice to review some safety rules of the road and that if you collide with another student, you will be removed from the activity. ‘Speeding’ is not allowed!
- If you find that you are running out of time to complete the entire lesson, omit the “Pedestrian” portion and skip directly to the “Reflection” portion.



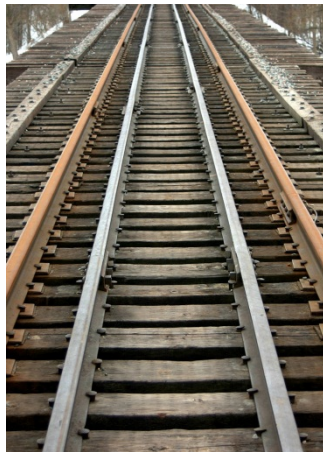
TEACHER TIPS  
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SYSTEMS  
LESSON 3.1 – A MAGNETIC  
PERSONALITY

- Begin the class by showing to students the sample Maglev track and describe to students that they will be designing a Maglev track and vehicle.
- This lesson is designed for students to have ample time to explore the properties of magnets
- They should take time to figure out exactly what is going on in each station. Simply telling students that they will not be rushed makes a significant difference!



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LESSON 3.2 – A MAGNETIC  
PERSONALITY

- Prior to beginning each lesson, review the worksheets associated with each station as a refresher to the class.
- Make sure that students have ample time to complete the “Find the Poles” station. This station is crucial because it helps students determine how to find the poles of a variety of magnets, which are included in the final design challenge. We found that if students didn’t participate in this station, they struggled with their designs. Consider doing this as a whole class lesson.



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LESSON 3.3 – A MAGNETIC  
PERSONALITY

- Model for students how to hold each magnet on the paper for the Magnet Strength Test. If there is time, allow them to compare other ways to hold the magnet. Is there a difference?
- Use small paperclips for Magnet Strength.
- This activity is also a great place to further highlight magnetic fields and their effect on surrounding magnets and metal. Reinforce the idea of magnetic fields – magnets have fields beyond just the poles.



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LESSON 4.1 – DESIGNING A  
MAGLEV SYSTEM

- Begin this lesson by showing the students an example of the track and Maglev vehicle while once again explaining that the goal will be to design a Maglev Transportation System.
- Prior to beginning the PLAN process, be sure to revisit the 'Properties of Magnets' chart that the class created in lesson 3.
- During the IMAGINE section, try to have the class complete the worksheet in a quiet environment to allow students to focus.



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LESSON 4.2 – DESIGNING A  
MAGLEV SYSTEM

- If you feel your group is ready for an additional challenge, introduce them to the idea of creating ‘bumpers’ on the ends of the Maglev vehicles.
- Make it known to your students that they must complete ‘4-5 Plan!’ before they will be allowed to gather materials for their final designs. This ensures that they complete the entire worksheet and that the entire group has agreed and decided on a final design.





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### LESSON 4.3 – DESIGNING A MAGLEV SYSTEM

- Be sure to allot at least 10 – 15 minutes at the start of this lesson (“Create, Improve”) for the groups to share out their first designs with the class. This part of the lesson gives groups other ideas and perspectives as they begin to plan/improve their final designs.
- Remind students that this is not a competition and that their goal here is to improve on their initial designs and not to ‘beat’ the other groups.