

Name: _____



DESIGN PORTFOLIO: SPEED CATEGORIES

The steps in this Design Portfolio will help you complete your MAGLEV vehicle design. Writing down what you did or what you discovered in each step will help you learn from your work. It will also help the contest judges understand your design approach.

You must submit this **completed** portfolio with your vehicle to be considered for judging in the contest. Your Portfolio will become the property of BNL upon submission.

****Your name must be on your vehicle and on every page of this portfolio.****

1) **Student Name:** _____

2) **School Name:** _____

3) **School address:** _____

4) **Grade:** _____

5) **Teacher name:** _____

6) **Teacher e-mail address:** _____

7) **Contest Category:** (circle one)

Speed (Gravity)

8) **Why did you choose this MagLev category?**

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9) Problem Statement: The MagLev Challenge

Design and construct the fastest MAGLEV vehicle that can be pulled down a track by gravity alone (no other propulsion systems are allowed). It **must** levitate and travel the entire length of a standard track with a vertical drop of 2 feet over its 16-foot length in the shortest time possible.

10) Investigation

a) What information do you need to know before you start?

b) List questions which must be answered to create a successful vehicle.

c) Can some answers be found by simple tests? Give examples.

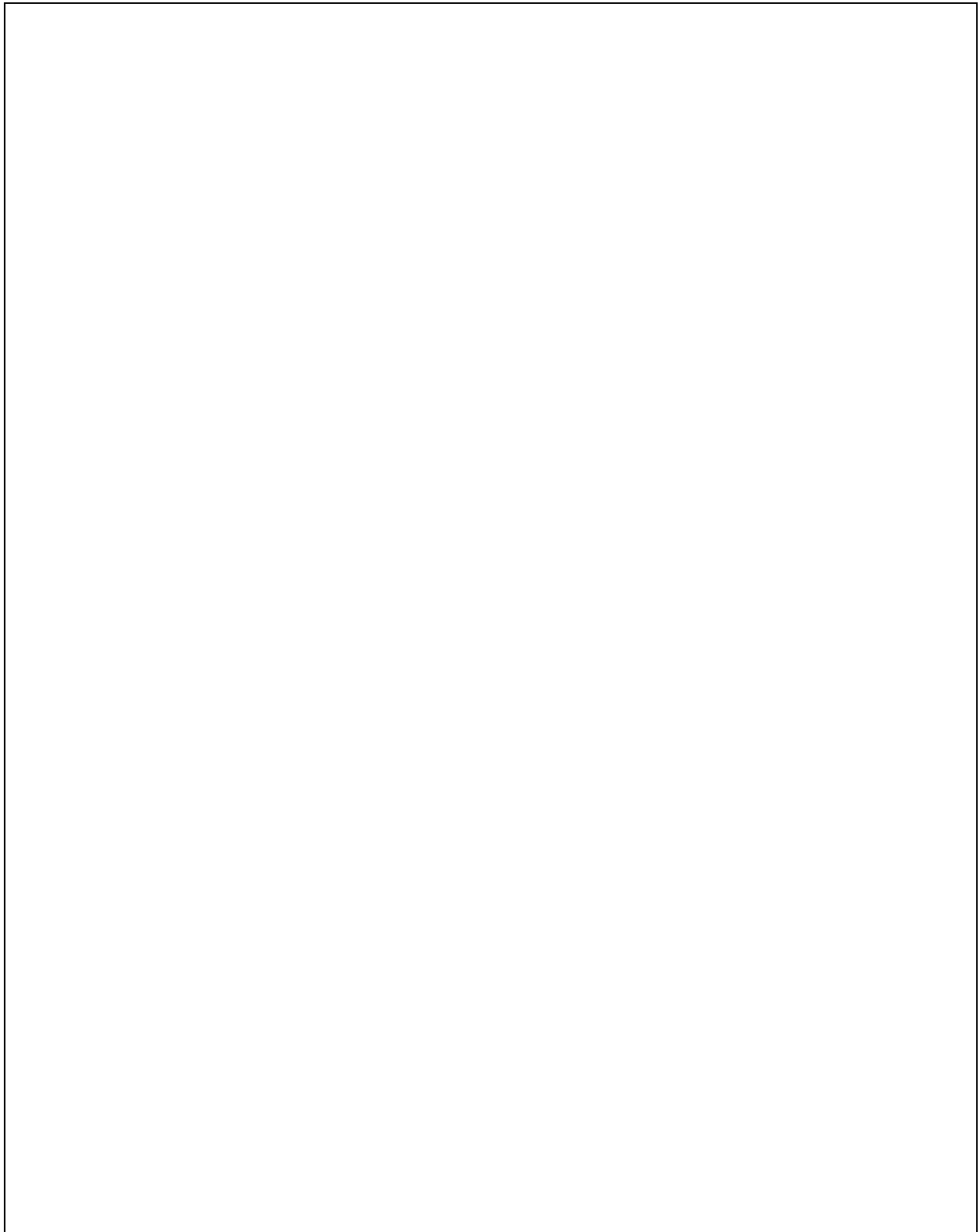
11) Brainstorming for Solutions

Write about the different designs you thought of using. For example, what materials it could be made from, the number of magnets, length, height, how to attach parts, etc.

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12) Initial Design Sketch:

Draw your ideas for the vehicle you plan to build in the space below.

A large, empty rectangular box with a thin black border, intended for a student to draw their initial design sketch of a vehicle. The box occupies most of the lower half of the page.

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13) Optimum Design:

Describe what you decided would be the best vehicle design and describe the reasons for deciding on this design instead of the others you had thought of.

14) Testing and Analysis:

a) What tests did you perform to learn how well your first design worked?

b) Describe any problems that you found with your vehicle and what changes you made to solve them. (Design sketches, performance charts and graphs are very helpful. Attach any to this Design Portfolio).

15) Final Design:

What did you do to improve your first design? How well did this work?

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16) Evaluation:

a) Describe/sketch your final design in the space below.



b) Give your best guess on how your vehicle will perform.
