



Maryland Engineering Challenges Safe Racer Challenge

Elementary Level – Grades 2 and 3

Frequently Asked Questions:

- What is this engineering challenge about?
 - Designing and building from mostly recycled materials a race car that will protect its driver, Eggbert/Eggberta (a raw egg), when the car is sent hurtling down a ramp and crashes into a wall.
- What grades of students may participate in this challenge?
 - Primarily third grade students; however, second grade students can participate.
- How many students can be on a team?
 - A maximum of six.
- Can a school/teacher enter more than one team?
 - Yes; however, should there be more than a total of 50 teams registered, the maximum number of teams that can be processed during the allotted time (9:00 AM to 3:00 PM), it may be necessary to combine some teams. In this case, the maximum number of 6 students per team may be increased so all registered students can participate. Should a reduction of teams per school be necessary, the affected teams will be notified four weeks before the date of the Challenge (two weeks before the due date for the reports)
- Is there a cost to participate in this challenge?
 - There is no additional cost to participate in the Challenge outside of any materials not already included in the kit to complete the project.
- Can homeschooled students or students not associated with a particular school participate?
 - Yes. The Challenges are open to all schools, both public and private; to any organization such as scouts, religious, Boys and Girls Clubs, etc.; and to individual families, anywhere within the State of Maryland.
- The challenge requires submission of a written report, can I submit this electronically?
 - Yes, the report is to be submitted digitally by PDF to challenges@thebmi.org
- What are the monumental dates of the challenge?
 - The dates vary from year to year. See the Challenge Rules and Guidelines at <https://bit.ly/BMIchallenges>
- When and where is the performance competition part of the challenge held?
 - The competition event is hosted in-person at the Baltimore Museum of Industry.
- How long is the performance competition itself?
 - The Safe Racer Challenge time frame will be starting at 9:00 AM and the run time is dependent upon the number of teams participating. But the absolute latest it will run is 3:00 PM.
- If my school system has Safe Racer as part of its curriculum, can I still enter this challenge?
 - Yes; however, the timing of the Maryland Safe Racer Engineering Challenge may not be in sync with the school curriculum and it may be necessary do the Maryland Challenge separate from the classroom challenge.
- Are any parts provided? What do I do if I need additional parts?

- o All parts of the race car are to be made from recycled materials except for the wheels, axels and connection materials, such as glues, tapes, staples, rubber bands, etc. Wheels, axels and swizzle straws (axel housings) are provided, one set for each team, at no charge. Only the provided wheels and axels can be used. Axel housings other than the provided swizzle straws may be used. The provided wheels cannot be modified in any way, and nothing can be attached to them other than the axel. Additional wheels and axels can be purchased from www.kelvin.com, item # 990171
- What are the major ideas that the Safe Racer Challenge feels participants should know in order to be successful? (i.e. friction, momentum, kinetic and potential energy)
 - o Please see the Safe Racer information guide for curriculum ties to the project. In addition to having fun, the intent of the Safe Racer Challenge is to teach students some fundamentals about friction (friend and foe), momentum and impact (the heavier the car the harder it hits the wall), potential and kinetic energy (gravity is the fuel that propels the car), and acceleration and velocity (feather and lead weight falling in a vacuum -> the weight of the car has little effect on its velocity at the bottom of the ramp and just how far it will go down the track, see https://en.wikipedia.org/wiki/Galileo%27s_Leaning_Tower_of_Pisa_experiment); all within their level of comprehension.
- Does BMI have a ramp my school can borrow?
 - o A LIMITED number of Safe Racer test ramps are available from the BMI. A ramp may be purchased for \$50 or may be rented for \$20 with an additional \$30 refundable deposit. In addition, free construction plans are available electronically. To arrange, contact Jessica at challenges@thebmi.org
- Can BMI set up their track on one or more weekday evenings, weekends so that teams can test their cars?
 - o No. Unfortunately, there are currently no plans to set the track up other than for the competition.
- Does BMI have some lesson plan ideas for me to teach the important concepts?
 - o Upon request, the BMI can provide the Baltimore County teachers guide to the Safe Racer curriculum.