

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 no 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 a \$5.00 registration fee per teacher/coach, regardless of the number of teams.
- 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?
 - No. At this time, we do not have the resources to receive reports in an electronic format and print them out, or to have a group of judges review them on screen.
- What are the monumental dates of the challenge?
 - The dates vary from year to year. See the Challenge Rules and Guidelines at <http://www.thebmi.org/visit/maryland-engineering-challenges/>
- When and where is the performance competition part of the challenge held?
 - The Maryland Engineering Challenges are held at the Baltimore Museum of Industry, 1415 Key Highway, Baltimore, MD 21230. The dates vary from year to year. See the Challenge Rules and Guidelines on at <http://www.thebmi.org/visit/maryland-engineering-challenges/>
- How long is the performance competition itself?

- The Safe Racer Challenge time frame at the BMI is from 9:00 AM doors open for check-in to around 3:00 PM, after the award ceremony.
- 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?
 - 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. Additional wheels and axels can be purchased from www.kelvin.com, item # 990171
- What are the major ideas that BMI feels participants should know in order to be successful? (i.e. friction, momentum, kinetic and potential energy)
 - 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); all within their level of comprehension.
- Does BMI have a ramp my school can borrow?
 - 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 jcelmer@thebmi.org after November 1.
- Can BMI set up their track on one or more weekday evenings, weekends so that teams can test their cars?
 - 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?
 - Upon request, the BMI can provide the Baltimore County teachers guide to the Safe Racer curriculum upon request.
- Will there be an info session I can attend that will better help me understand the scope of the competition?
 - There is an info session scheduled in November, where teachers/coaches can see what each Engineering Challenge is all about in order to decide which Challenge they (their students) may like to do. At this info session, The Safe Racer Challenge is gone over in detail, answering many of the frequently asked questions about the project. For the date of the info session, see the Challenge Brochure at <http://www.thebmi.org/visit/maryland-engineering-challenges/>