

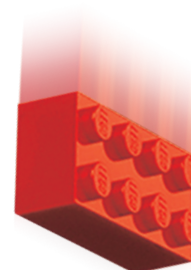
# Race Car Workshop



## Education Objectives

The objective of this workshop is to give your group the opportunity to:

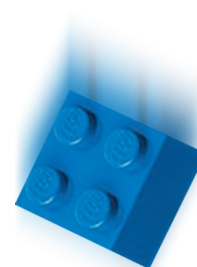
- Use mathematics and hypothesis testing to explore and understand elementary physics
- Relate concrete events to mathematics and physics
- Record data and analyze it to comprehend results and improve design



## Illinois Curriculum Standards

This resource corresponds to the following areas of the Illinois Curriculum:

- **Mathematics** Late Elementary
- **State Goal 6** Number Sense
- **6.B.2** Participants will use arithmetic to solve word problems related to distance and velocity
- **State Goal 10** Data Analysis and Probability
- **10.A.2a** Participants will organize their data on tables
- **10.A.2c** Participants will make predictions on their car performance and make decisions based on data
- **10.B.2d** Participants will be asked to use math and physics to interpret the results on their car's performance
- **Science** Late Elementary
- **State Goal 11** Inquiry and Design
- **11.A.2b** Participants will use instruments to measure their car's performance and the length of the track
- **11.A.2d** Participants will use data to explain their car's performance
- **11.B.2c** Participants will produce a prototype and final car
- **11.B.2d** Participants will use instruments to record data on the prototype car
- **11.B.2e** Participants will assess the results and effectiveness of their design and will note possible sources of error
- **State Goal 12** Concepts and Principles
- **12.C.2b** Students will demonstrate and describe the ways that friction and gravity affect their car



## Measurements and Conversions

**This information is intended to give you a quick overview of the major concepts in Race Car Workshops and give you ideas for activities prior to your visit.**

In science, individuals use measurements to determine the size, length, mass, etc. of an object or other quantity.

All scientific measurements use a unit of measurement to define a quantity.

There are two major systems of measurements used in the United States: the Imperial (English) System, and the International (Metric) System.

Common measurements in the Imperial System include:

- Feet
- Miles
- Gallons
- Pounds

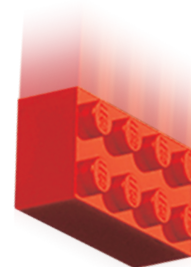
Common measurements in the International System include:

- Meters
- Kilometers
- Liters
- Grams

Measurements can be converted from units within between systems of measurements using mathematical formulas.

Some suggestions for fun and engaging activities to help your class get the most out of the Race Car Workshop:

- Have student use rulers or tape measures and measure common objects around the school such as the clock on the wall, the height of the door, the length of the gym, etc.
- Use conversion formulas to find lengths of common objects in uncommon units of measurement. For example, how many yards long is their pencil
- Have students get familiar with the metric system by first recording their height and weight in feet and pounds and then converting these measurements to the metric system



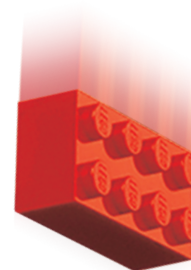
# Race Car Workshop



## During your visit

### Race Car Workshop

The Race Car workshop is a Fun, hands-on way to get participants excited about mathematics and introduce them to elementary physics. Participants build LEGO race cars, race them on a track, collect data, and use arithmetic to calculate their car's performance. Participants also learn about the forces that affect their cars and use this information to create lean racing machines.



## After the Workshop

### Build and Test

Grab some wheels and test out your new LEGO building skills in the Build and Test area. Race Ramps and Test Ramps are available to push your creation to its limits.

## Activities after the visit

### Classroom "Olympics"

- Create a race track and have students measure out the distance
- Have students race down the track and record their times
- Students can use this data to calculate their average speeds
- You can also create other events to expand your Olympics such as: Standing Long Jump, Softball or Shotput Throw, Relay Races, etc.



### Traffic Safety

- Have students form groups and discuss reasons for traffic laws and how they affect the way cars are engineered
- Have them answer questions such as:
  - What makes for a safe car?
  - What purpose do traffic signals have and what affect do they have on a car?
  - Why are there speed limits on highways?
  - What are the necessary accessories a car should have to keep people safe in an accident?
- Afterwards have them design a car that would help keep its passengers safe on the road

