

## CO<sub>2</sub> Dragster

Grades 9+ | Students Served: 50

HIGH SCHOOL



### Essential Questions

How do applied math and the use of measurement translate into your dragster design?

Why are the right tools and the right size of tools important?

What modifications can be made to meet specific specifications/tolerances for a dragster race?

### Career Connections:

- Classic Car Restorer
- Car Designer
- Automotive Journalist
- Test Car Driver

### STEM Connections

#### Science

- Newton's laws
- Modeling
- Aerodynamics
- Friction

#### Technology

- Design processes
- Finishing
- Troubleshooting
- Problem solving

#### Engineering

- Engineering design
- Prototyping
- Energy and power systems

#### Math

- Metric measurements
- Tolerances
- Calculating speed



**WARNING:** Drilling, sawing, sanding, or machining wood products can expose you to wood dust, a substance known to the state of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information, go to [www.P65Warnings.ca.gov/wood](http://www.P65Warnings.ca.gov/wood).



## Sample Activity

### Extraordinary Acceleration Challenge

Students determine the relationship between the mass of a CO<sub>2</sub> dragster and its average velocity

Students design and construct a Pitsco CO<sub>2</sub> dragster, measure the mass of the vehicle, and record the mass in their data table. Using a Pitsco launch and timing system, test the dragster using an 8-gram CO<sub>2</sub> cartridge and time it for a 20-meter distance. The average velocity is calculated using the formula velocity equals distance (meters) divided by time (seconds), or  $v = d/t$ .

From the recorded mass and time and the calculated velocity data, students determine what relationship dragster mass has with average velocity.

#### Discussion

- How does the dragster's mass relate to the its velocity? What else affects velocity?
- If you changed the mass of the dragster and launched it again, how would the velocity change?