

CO₂ Dragster

Grades 6+ | Students Served: 50

MIDDLE LEVEL



Essential Questions

How does mass affect speed?

How does aerodynamic drag affect speed?

What is the best way to design a car?

Career Connections:

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

STEM Connections

Science

- Newton's laws
- Modeling
- Friction

Technology

- Design processes
- Finishing
- Troubleshooting

Engineering

- Engineering design process
- 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.



Sample Activity

Extraordinary Acceleration Challenge

Students determine the relationship between the mass of a CO₂ dragster and its average velocity

Students design and construct a Pitsco CO₂ 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 CO₂ 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?