

## **NASCAR Science**

NASCAR Acceleration Nation: NASCAR race cars can reach speeds of more than 200 miles per hour. How do they do it? The NASCAR Acceleration Nation program brings STEAM alive in the classroom with fun, hands-on experiments that teach about aerodynamics. Students will build and decorate their own car (see sample photo) and use it for experiments to explain the following concepts in aerodynamics, the 3D's of speed: drag, downforce, airflow, drafting. They will also learn about energy: potential and kinetic and how it relates to speed and what role friction plays in NASCAR racing.



Lesson 1: **Start your Engines:** **Drag:** Students will define the science of aerodynamics. They will explain how drag influences moving objects. Lastly, be able to identify elements of a racecar that create drag.

Lesson 2: **Under Pressure:** **Downforce:** Students will explain how air pressure influences moving objects. They will identify how the speed of air determines the amount of pressure moving air exerts. Lastly, students will determine which combinations of air pressure create downforce and lift.

Lesson 3: **Tunnel Testing:** **Airflow:** Students will explain how engineers study drag and downforce to improve a race car's performance. Then, students will describe how a wind tunnel works.

Lesson 4: **Game Changer:** **Drafting:** Students will define the Strategy of drafting. Then, explain how aerodynamics principles help drafting cars move faster.

Lesson 5: **Hidden Energy:** **Potential Energy:** Students will define potential energy. They will list the four main types of potential energy. Lastly, students will identify forces that influence potential energy.

Lesson 6: **Energy in Motion:** **Kinetic Energy:** Students will define kinetic energy. They will identify forces that influence kinetic energy. Lastly, students will describe the relationship between potential and kinetic energy.

Lesson 7: **Under the Hood:** **Energy and Speed:** Students will explain the connection between potential and kinetic energy. They will explain how NASCAR engines work.

Lesson 8: **A Dynamic Duo:** **Friction and Energy:** Students will define friction. They will describe the relationship between friction and speed. Lastly, students will describe the relationship between friction and race car safety.