

Designing and Building Newton's Car

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9th Grade, Intro Physics

MA Frameworks: HS-PS3-2

Design and evaluate a device that works to convert one form of energy into another form of energy.

21st Century Skills:

Creativity & Innovation



MA Frameworks: HS-PS3-1

Use algebraic expressions and the principle of energy conservation to calculate change in energy.

Based on their understanding on Newton's Laws, students designed and built a Newton Car by manipulating common household materials, drew free body diagrams of forces acting on the car, and made calculations of energy conversions and motion of the car. They then wrote a project report and made a presentation detailing the Physics principles demonstrated by their car. Their project reports explained how Physics concepts such as velocity, momentum, and work were demonstrated by the car.

MA Frameworks: HS-PS2-10

Use free-body force diagrams, algebraic expressions, and Newton's laws of motion to predict changes to velocity and acceleration.

MA Frameworks: HS-ETS4-5

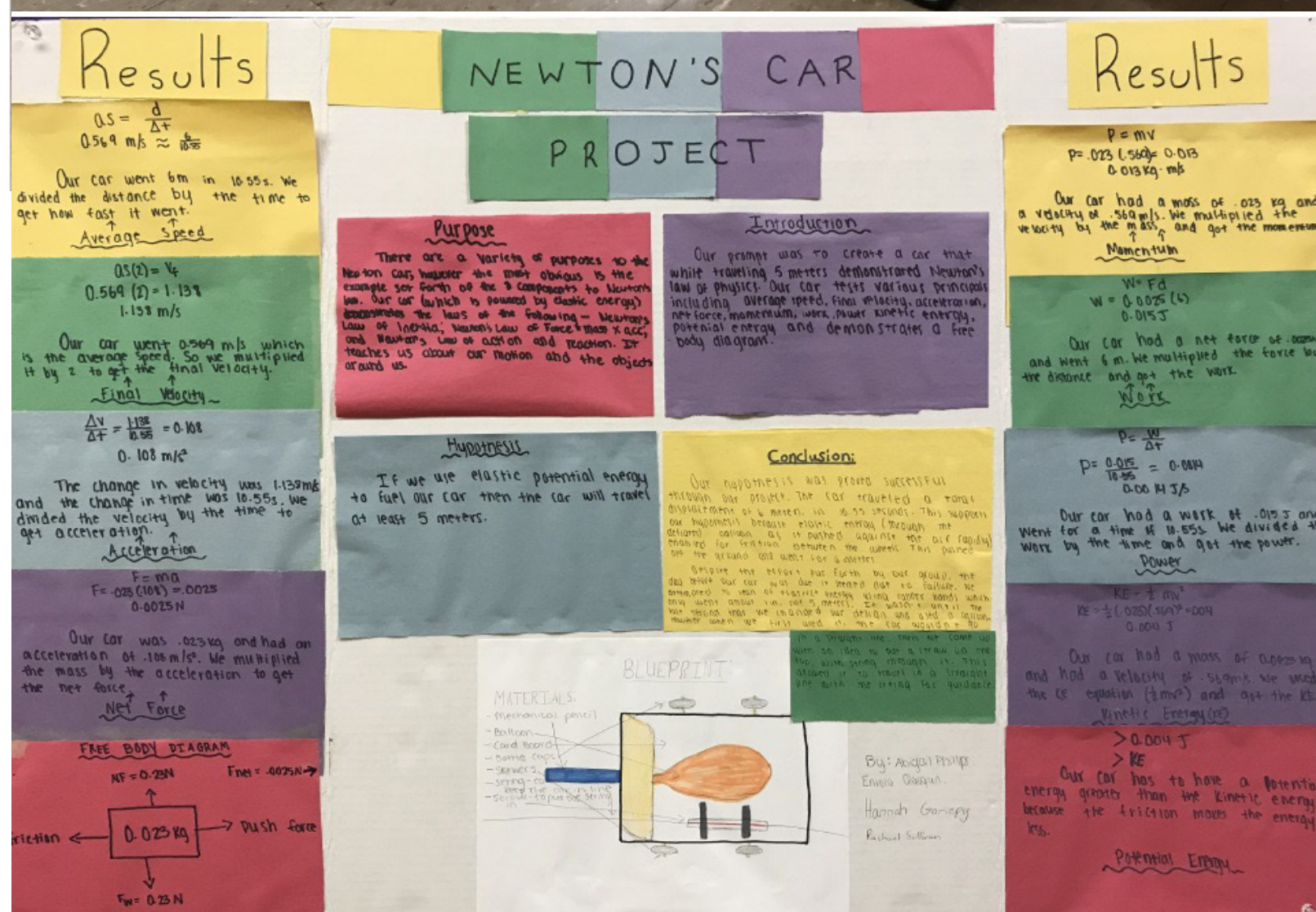
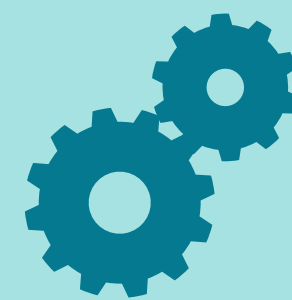
Explain how a machine converts energy, through mechanical means, to do work. Collect and analyze data to determine the efficiency of simple and complex machines.

21st Century Skill: Communication



21st Century Skill:

Critical Thinking



“ Since the solution to a posed problem is not on the page, but rather in their own minds, performance assessments allows students to take ownership over the material they are learning. This autonomy breeds happier students that are less fearful of “getting the wrong answer” and more likely to take risks and engage in trial and error.”

- Caroline Altieri

Above: Students placing their Newton Car on the testing track, measuring displacement and travel time. Below: Example poster presentation.



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