**Mandatory Performance Task**

**Newtonian Vehicle**

**What understandings or goals would be assessed through this task?**

• Students will identify the forces acting on a self-propelled vehicle and explain how the motion of the vehicle demonstrates Newton’s laws.

**Through what authentic performance task will students demonstrate understanding?**

Task overview:  
You will design, build, and test a self-propelling vehicle that can travel a minimum distance of one meter. When designing the vehicle, sketch a diagram showing how it will be propelled (balloon, rubber band, mousetrap, etc.) and the forces that act on the vehicle when it is stationary and moving. After building and testing the vehicle, write an essay explaining how your vehicle demonstrates Newton’s three laws of motion.

**What student products and performances will provide evidence of desired understandings?**

• Self-propelling vehicle prototype  
• Vehicle schematic showing propulsion mechanism and forces acting on vehicle  
• Essay detailing how the vehicle demonstrates each of Newton’s laws

**By what criteria will student products and performances be evaluated?**

Vehicle  
• Vehicle is self-propelling  
• Vehicle moves a minimum of one meter

Schematic  
• Diagram illustrates how the vehicle is propelled  
• Diagrams present for stationary and moving vehicle, with forces acting on vehicle indicated and net force described

Essay  
• Addresses Newton’s three laws of motion  
• Step Up to Writing-style essay