Table 1. NGSS and CCSS Standards

NGSS Physical Science	CCSS ELA
HS-PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	CCSS.ELA-LITERACY.WHST.11-12.1 Write arguments focused on discipline-specific content.
HS-PS3-1 Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.	CCSS.ELA-LITERACY.WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
NGSS Disciplinary Core Ideas	
PS2.A: Forces and Motion • Momentum is defined for a particular frame of reference; it is the mass times the velocity of the object. • If a system interacts with objects outside itself, the total momentum of the system can change; however, any such change is balanced by changes in the momentum of objects outside the system.	
PS3.A: Definitions of Energy • Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms.	
PS3.B: Conservation of Energy and Energy Transfer • Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system.	

• Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. • Mathematical expressions, which quantify how the stored energy in a system depends on its configuration (e.g. relative positions of charged particles, compression of a spring) and how kinetic energy depends on mass and speed, allow the concept of conservation of energy to be used to predict and describe system behavior. • The availability of energy limits what can occur in any system.	
NGSS Science and Engineering Practices	
3. Planning and carrying out investigations 4. Analyzing and interpreting data 5. Using mathematics and computational thinking 6. Constructing explanations (for science) and designing solutions (for engineering) 7. Engaging in argument from evidence 8. Obtaining, evaluating, and communicating information	
NGSS Crosscutting Concepts	
2. Cause and Effect 4. Systems and System Models 5. Energy and Matter	