

Unit 6 - Force and Motion

Content Area: **Science**
Course(s): **Science 4**
Time Period: **February**
Length: **Marking Period 3**
Status: **Published**

Unit Summary

In this unit of study, students are able to use evidence to construct an explanation of the relationship between the speed of an object and the energy of that object, and are expected to develop an understanding that energy can be transferred from object to object through collisions. The crosscutting concept of Energy and Matter is called out as an organizing concept. Students are expected to demonstrate grade-appropriate proficiency in asking questions, defining problems, and constructing explanations, and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Standards

| | |
|------------------|--|
| LA.RI.4.1 | Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. |
| LA.RI.4.3 | Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. |
| LA.RI.4.9 | Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably. |
| LA.W.4.8 | Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. |
| LA.W.4.9 | Draw evidence from literary or informational texts to support analysis, reflection, and research. |
| SCI.4.4-PS3-3 | Ask questions and predict outcomes about the changes in energy that occur when objects collide. |
| SCI.4.4-PS3-1 | Use evidence to construct an explanation relating the speed of an object to the energy of that object. |
| TECH.8.1.5.A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. |
| TECH.8.1.5.A.CS2 | Select and use applications effectively and productively. |

Student Learning Objectives

SLO 1: Use evidence to construct an explanation relating the speed of an object to the energy of that object. (4-PS3-1)

SLO 2: Ask questions and predict outcomes about the changes in energy that occur when objects collide. (4-PS3-3)

Essential Questions

What is the relationship between the speed of an object and the energy of that object?

Part A: What is the relationship between the speed of an object and its energy?

Part B: In what ways does energy change when objects collide?

Enduring Understandings

Students will understand that:

- the faster a given object is moving, the more energy it possesses. (4-PS3-1)
- energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-3)
- energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (4-PS3-3)
- when objects collide, the contact forces transfer energy so as to change the objects' motions. (4-PS3-3)
- Energy can be transferred in various ways and between objects. (4-PS3-1) (4-PS3-3)

Application

Students will be able to independently use their learning to:

- describe various ways that energy can be transferred between objects.
- use evidence (e.g., measurements, observations, patterns) to construct an explanation.
- use evidence to construct an explanation relating the speed of an object to the energy of that object.
- describe the various ways that energy can be transferred between objects.
- ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
- ask questions and predict outcomes about the changes in energy that occur when objects collide.

Skills

Students will be skilled at: