Unit 4: Forces and Motion & Electrical and Magnetic Forces

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

How do equal and unequal forces on an object affect the object? Students are able to determine the effects of balanced and unbalanced forces on the motion of an object. The crosscutting concepts of patterns and cause and effect are identified as organizing concepts for these disciplinary core ideas. In the third-grade performance expectations, students are expected to demonstrate grade-appropriate proficiency by planning and carrying out investigations. Students are expected to use these practices to demonstrate understanding of the core ideas.

Enduring Understandings

Understand the strength and direction of a force can change the motion of an object
Understand balanced and unbalanced forces.
Understand the forces of objects when they are not in contact with each other.
Understand that unbalanced forces affect the motion of an object.

Essential Questions

What are forces?
What forces act from a distance?
What is motion?
What are some patterns in motion?
How can you unlock a door using a magnet?
What do magnets do?

Learning Objectives

Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
Include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all.
Determine cause and effect relationships of magnetic interactions between two objects not in contact with each other.
Understand when a net force of zero happens (balanced force).
Understand when there will not be a net force of zero (unbalanced force).
Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used

to predict future motion.
Identify motion with a predictable pattern.
Explain magnetic attraction and repulsion.
How to explain that friction is an invisible contact force that opposes motion or makes it difficult for an object to travel across a surface.
Engage in the engineering design process to test and improve designs
Career Exploration - Explore careers related to science and engineering.

Standards: Content

3-PS2-1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-PS2-2	Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
3-PS2-3	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
3-PS2-4	Define a simple design problem that can be solved by applying scientific ideas about magnets.

Standards: Interdisciplinary

RI.CR.3.1	Ask and answer questions and make relevant connections to demonstrate understanding of an informational text, referring explicitly to textual evidence as the basis for the answers.
RI.CI.3.2	Recount in oral and written form the key details from a multi-paragraph informational text and explain how they support the main idea.
RI.IT.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
RI.TS.3.4	Utilize and reference features of a text when writing or speaking about a text, using text features (e.g., graphics, images, captions, headings) and search tools (e.g., key words, sidebars, hyperlinks) to locate and integrate information relevant to a given topic efficiently.
RI.PP.3.5	Distinguish their own point of view from that of the author of a text.
RI.MF.3.6	Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
RI.AA.3.7	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) to support specific

	points the author makes in a text.
RI.CT.3.8	Compare and contrast the elements of informational texts regarding the most important points and key details presented in two texts on the same topic.
W.IW.3.2.A	Introduce a topic clearly.
W.IW.3.2.B	Develop the topic with facts, definitions, and concrete details, text evidence, or other information and examples related to the topic.
W.IW.3.2.C	Include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.
W.IW.3.2.D	Link ideas within sections of information using transition words and phrases (e.g., then, because, also, another, therefore).
W.IW.3.2.E	Provide a conclusion related to the information or explanation presented.
SL.ES.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
SL.UM.3.5	Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.
SL.AS.3.6	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	Projects, Tests, Quizzes, lab skills demonstrations, projects, and vocabulary quizzes.
Alternative & Benchmark	Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes. Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials, crayons, colored pencils, markers, graph paper, charts, tape, scissors, magnets, cotton, wool, fur, leather Third Grade Science Course

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
X	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness		Relationship Skills
X	Responsible Decision-Making		Social Awareness
	Self-Management		

21st Century Skills & Themes

X	Global and Cultural Awareness		Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
X	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
X	Critical Thinking and Problem Solving		Credit Profile	X	Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		