Unit 1 Invisible Forces

Content Area: **Science**
Course(s): **Science 1**
Time Period: **September**
Length: **30 Instructional Days**
Status: **Published**

Unit Overview

Unit 1 should be taught over the course of Trimester 1. Unit 1 includes the Science standards from Mystery Science Unit 1 (Invisible Forces).

The Big Idea: *Invisible Forces*

Unit 1	**Topic**
Anchor Phenomenon	Anchor Phenomenon
Lesson 1	Balanced & Unbalanced Forces How could you win a tug-of-war against a bunch of adults?
Lesson 2	Balanced Forces & Engineering What makes bridges so strong?
Lesson 3	Patterns of Motion, Gravity, & Friction

	How high can you swing on a flying trapeze?
Lesson 4	Magnets & Forces What can magnets do?
Lesson 5	Magnets & Engineering How can you unlock a door using a magnet?
Performance Task	Performance Task

Priority Standards

SCI.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.
SCI.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.
SCI.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.
SCI.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.

Learning Goals (Targets)

Trimester 1 ~ Mystery Science Unit 1 (Invisible Forces)

Time Frame	Lesson	Standard(s)	Target
	Anchor Phenomenon	3-PS2-1, 3-PS2-3, 3-5-ETS1-1, 3-5-ETS1-2	
Unit 1 ~ Invisible Forces (5-10 weeks)	Lesson 1 Balanced & Unbalanced Forces How could you win a tug-of-war against a bunch of adults?	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.	I can recognize the cause and relationship between the force object and the direction of its m

Students build a Hopper Popper to carry out an investigation about force and motion. They construct an explanation for which direction the forces act on the object, causing it to hop.		
Lesson 2 Balanced Forces & Engineering What makes bridges so strong?	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.	
Students define a problem - designing a bridge that will hold the most weight - and its constraints, it can only be made of paper. They collaborate with peers to design multiple solutions. They carry out investigations to test each of their prototypes, determine how to improve their design.	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	I can explore the relationship b structure and function of differ designs.

Lesson 3 Patterns of Motion, Gravity, & Friction How high can you swing on a flying trapeze? Students use a model of a slide to carry out an investigation. They ask questions about different materials and weights and test their ideas to explore which combinations move the fastest down the slide. Students then complete a fair test to determine which material has the least friction. They engage in argument from evidence to share their findings.	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.	I can consider the cause and e relationship between a materia the amount of friction it has.
Lesson 4 Magnets & Forces What can magnets do?	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.	I can consider the cause and e relationship between this dista and the strength of the force.
Students ask questions about magnets and develop and carry out investigations to observe the different properties		I can consider the cause and e relationship between which dir magnets are facing and if they on one another.

of them.		
	3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.	
Lesson 5 Magnets & Engineering	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.	
How can you unlock a door using a magnet? Students design a solution for a magnetic lock by developing a model.	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.	Students consider the cause ar relationship between two magı so design solutions using the e process.
Performance Task	3-5-ETS1-1, 3-5-ETS1-2	

Learning Targets

- I can consider the cause and effect relationship between a material's surface and the amount of friction it has.
- I can consider the cause and effect relationship between this distance of a magnet and the strength of the force.
- I can consider the cause and effect relationship between which direction two magnets are facing and if they will push or pull on one another.
- I can explore the relationship between the structure and function of different bridge designs.
- I can recognize the cause and effect relationship between the forces acting on an object and the direction of its motion.
- Students consider the cause and effect relationship between two magnets as a way to so design solutions using the engineering process.

Essential Questions

- How can you unlock a door using a magnet?
- How could you win a tug-of-war against a bunch of adults?
- How high can you swing on a flying trapeze?
- What can magnets do?
- What makes bridges so strong?

Materials and Resources

- Google Drive - Third Grade Team Drive
- Mystery Science ~ Online

Unit Assessments

- Lesson 1 Exit Ticket
- Lesson 2 Exit Ticket
- Lesson 3 Exit Ticket
- Lesson 4 Exit Ticket
- Lesson 5 Exit Ticket
- Unit 1 Assessment

Learning Plan

Trimester 1 ~ Mystery Science Unit 1 (Invisible Forces)

Time Frame	Lesson	Standard(s)	
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	Lesson 2 Balanced Forces & Engineering	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.	I can explore th structure and fu designs.

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Lesson 4	3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic	I can consider t relationship bet

Magnets & Forces	interactions between two objects not in contact with each other.	magnet and the
What can magnets do? Students ask questions about magnets and develop and carry out investigations to observe the different properties of them.		I can consider t relationship bet magnets are fa pull on one anc
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Performance Task	3-5-ETS1-1, 3-5-ETS1-2	

Strategies for Multilingual Learners

- Communicating High Expectations for Each Student to Close the Achievement Gap
- Establishing & Maintaining Effective Relationships in a Student Centered Classroom
- Helping Students Engage in Cognitively Complex Tasks
- Helping Students Examine Similarities & Differences
- Helping Students Examine their Reasoning
- Helping Students Practice Strategies, Skills, & Processes
- Helping Students Process New Content
- Helping Students Revise Knowledge
- Identifying Critical Content from the Standards
- Organizing Students to Interact with Contact
- Previewing New Content
- Providing Feedback & Celebrating Success
- Reviewing Content
- Using Engagement Strategies
- Using Formative Assessment to Track Progress
- Using Questions to Help Students Elaborate on Content

Strategies for Students in Need of Intervention

- Centers to reinforce skill instruction/ skill enrichment
- Choice boards/ Activity Menu for assignments
- Extend pacing of weekly lessons to a week and a half to 2 weeks
- Flexible grouping as needed based on ability, interest, need
- Highlight key terms
- Provide word bank for vocabulary assessment
- Provide written notes/directions
- Tiered lessons/activities

- Use graphic organizers (ex. Venn Diagram, etc.)
- Use of visual aids (For example: Powerpoints, images to connect to vocabulary, flashcards, anchor charts)
- Vocabulary matching words to definitions

Strategies for Enrichment

- Students can complete Mystery Science Mini-Lessons

Technology Integration

- Carolina Science Website

TECH.8.1.5	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.A.3	Use a graphic organizer to organize information about problem or issue.
TECH.8.1.5.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.5.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.5.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media
TECH.8.1.5.C.CS4	Contribute to project teams to produce original works or solve problems
TECH.8.1.5.E.CS1	Plan strategies to guide inquiry.
TECH.8.1.5.E.CS3	Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
TECH.8.1.5.F.1	Apply digital tools to collect, organize, and analyze data that support a scientific finding.
TECH.8.1.5.F.CS1	Identify and define authentic problems and significant questions for investigation.
TECH.8.1.5.F.CS2	Plan and manage activities to develop a solution or complete a project.
TECH.8.1.5.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.5.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions
TECH.8.2.5	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Interdisciplinary Connections

LA.3.CCSS.ELA-Literacy.RI.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
LA.3.CCSS.ELA-Literacy.RI.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.
LA.3.CCSS.ELA-Literacy.RI.3.8	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).

LA.W.3.7	Conduct short research projects that build knowledge about a topic.
LA.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
LA.SL.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
MA.3.MD.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

21st Century Life & Career Ready Practice

CAEP.9.2.4.A.1	Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
CAEP.9.2.4.A.2	Identify various life roles and civic and work - related activities in the school, home, and community.
CAEP.9.2.4.A.3	Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.