

CRM 3 Force, Motion and Energy

Pacing

- 20 days
- Oct. 15-Nov. 9
- Week 8-11

DESIRED RESULTS

Making Meaning

The study of force, motion, and energy leads students to discovering how objects interact with each other in the real world. Students are very familiar with force, motion, and energy if they play sports, push strollers, pull wagons, and ride bikes or skateboards. These concepts build a foundation for the secondary science in the study of Physics, Astronomy, and Engineering. The following make meaning valuable for learners and are investigated in this unit:

- Energy can cause a variety of effects as it moves from place to place including: motion, light, sound, electricity, magnetic fields, and heat.
- Energy is always conserved within a system and remains constant until it is transferred into or out of the system.
- The faster an object moves the more energy it possesses.
- When objects interact each one exerts a force on the other; these forces can transfer energy between the objects.
- The strengths of forces can be measured and compared.
- What happens when a force is applied to an object depends on the strength of the force itself, and the strength of the other forces acting upon it.
- If an object is at rest the forces acting on it are most likely equivalent.
- Forces that are imbalanced can cause changes in the speed or direction of an object.
- Gravity is a force that acts on matter.

Transfer: Students use critical thinking and problem solving to construct their own scientific understanding of forces and motion and develop their scientific process skills by asking scientific questions, designing and conducting investigations, constructing explanations from their observations, and discussing their explanations with others as they investigate energy, and forces and motion.

Enduring Understandings:

- Energy in its many forms is useful in our everyday lives.
- Energy causes change.
- Location and motion can be observed and described.

Essential Questions:

- What is energy, and how do we use it in our everyday life?
- How can location and motion be observed and described?

Essential Vocabulary

- change / cambio
- attract/atraer
- bounce/rebotar
- change / cambio
- close/cerca
- closer / más cerca
- energy/energía
- farther / más lejos
- force / fuerza
- form/ forma
- heat/térmica
- important/ importante
- light/luminosa

- magnetism/ magnetismo
- motion / movimiento
- nearer / más cerca
- shadow/ sombra
- pattern/patrón
- pole/polo
- position/posición
- pull/jalar
- push/empujar
- repel/repler
- shadow/ sombra
- sound/sonido

Supporting Vocabulary Link

- [Elementary School Supporting Vocabulary](#)

Student Prerequisite Knowledge

Students should know:

- energy comes in many forms.
- senses are important to identifying forms of energy such as light, heat, and sound.
- energy can come from natural or man-made sources.
- forces change or move objects.
- magnets have a force that can push or pull metal objects containing iron.
- magnets are part of everyday life.
- objects can change location.
- objects can move due to forces and energy.

Resources: AISD Module Kit, Model Lesson Portfolio, [STEMscopes](#), eBooks: Envisions Science Levelled Readers, Scott Foresman Text, [Science Notebook Resources](#), [BrainPop Jr.](#), [Discovery Education](#), [Differentiation Strategies & Resources](#)

ELPS: Mandated by Texas Administrative Code (19 TAC §74.4), click on the link for [English Language Proficiency Standards \(ELPS\)](#) to support English Language Learners.

TEKS Knowledge & Skills	Acquisition <i>Important knowledge and skills</i>	
STAAR: RC = Reporting Category; DC = Dual Coded Skills; Readiness Standard ; Supporting Standard Concepts are addressed in another unit.	Students Will Know	Students Will Be Able To
1.6 Force, motion, and energy. The student knows that force, motion, and energy are related and are a part of everyday life.		
1.6A: identify and discuss how different forms of energy such as light, heat, and sound are important to everyday life;	<ul style="list-style-type: none"> • Energy comes in many forms. • Sound, light and heat energy are important to everyday life. • Energy gives us power to run our homes, schools, cars and businesses. 	<ul style="list-style-type: none"> • Identify heat, light, and sound as forms of energy. • Describe sources of light, heat, and sound energy. • Use prior knowledge to investigate the importance of energy in their own lives. • Identify sources of light, heat, and sound used in everyday life. • Demonstrate and explain how light is important in forming shadows. • Identify how the location of a light source determines the length and shape of shadows. • Differentiate between sources of heat and things that hold in heat. • Explain how heat energy causes change. • Identify objects and actions by the sounds they make.

<p>1.6B: predict and describe how a magnet can be used to push or pull an object;</p>	<ul style="list-style-type: none"> • Forces change or move objects. • Magnets have a force that can push or pull an object. • Magnets are part of everyday life. 	<ul style="list-style-type: none"> • Demonstrate listening comprehension by following directions to show understanding that like poles of magnets push away from each other. • Demonstrate that opposite poles of magnets pull toward each other. • Demonstrate that magnetic force can pass through some materials.
<p>1.6C: describe the change in the location of an object such as closer to, nearer to, and farther from;</p>	<ul style="list-style-type: none"> • Objects can change location when a force is applied. 	<ul style="list-style-type: none"> • Describe changes in location. • Make sound travel farther by focusing the vibrations toward a location. • Make sound travel farther to hear someone from a long distance.
<p>1.6D: demonstrate and record the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.</p>	<ul style="list-style-type: none"> • Objects can move in different patterns due to forces and energy. 	<ul style="list-style-type: none"> • Identify and demonstrate objects that move in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.
<p>The study of science is taught through the lens of Scientific Processes (TEKS 1.1-1.4); therefore, these TEKS should be taught in conjunction with content throughout the year. Suggestions for TEKS to embed in each unit are provided in the Yearly Itinerary; however, the TEKS that can be addressed within a unit depends greatly on the learning activities in which students are engaged. Therefore, teachers must be deliberate in their choice of learning activities to ensure that all Scientific Processes TEKS are appropriately embedded within the course. In 1st grade, districts are encouraged to facilitate laboratory and field investigations for at least 80% of instructional time.</p>		

ASSESSMENT EVIDENCE

Student Work Products/Assessment Evidence

Performance Tasks	Other Evidence (i.e. unit tests, open ended exams, quiz, essay, student work samples, observations, etc.)
<ul style="list-style-type: none"> • <i>Forms of Energy Investigation</i> Students identify heat, light, and sound as forms of energy and classifying picture vocabulary cards into a concept map to them. • <i>Energy I Use Investigation</i> Students describe sources of light, heat, and sound energy by using the sentence stem ____ is a source of light/heat/sound energy because ____ . • <i>Shadow Investigation</i> Students demonstrate and explain how light is important in forming shadows in Think Pair Share situations (ELPS 3D-Speaking). • <i>Sources of Heat Investigation</i> Students differentiate between sources of heat and things that hold in heat by classifying picture vocabulary cards into a T-chart. • <i>Holding Heat Investigation</i> Students explain how heat energy causes change by sharing information in cooperative groups using a round robin structure. • <i>Mystery Sounds Investigation</i> • <i>How Far Can You Hear? Investigation</i> • <i>Magnets in Water Investigation</i> • <i>Magnet Racers Investigation</i> Students demonstrate listening comprehension by following directions to show understanding that like poles of magnets push away from each other. • <i>Playground Motion Observations</i> • <i>What Travels in a Straight Line Investigation</i> Students write using a sentence stem and selected vocabulary to identify and demonstrate objects that move in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow. • <i>What Travels Back and Forth? Investigation</i> • <i>What Goes Round Investigation</i> • Students design and build a model of a new piece of playground equipment. Students will use their science notebook as a thinking tool to describe and explain their design with increasing specific. • <i>Jump Rope Motion Demonstration</i> 	<ul style="list-style-type: none"> • Teacher Observations and Questioning • Science Notebook Entries • Think-Pair-Share • <i>Forms of Energy</i> Matching Activity • <i>Energy I Use</i> Student Page • <i>Forms of Energy</i> Blank Grid • <i>My Changing Shadow</i> Data Chart • <i>What Can Heat Do?</i> Cards • <i>What's That Sound?</i> Student Page • <i>Magnets in Water</i> Question Prompt/4 Corners • <i>What Travels in a Straight Line</i> Data Chart • <i>What Travels Back and Forth?</i> Data Chart • <i>How Does it Move?</i> Card Activity

LESSON PLANNING TOOLS

In the course of lesson planning, it is the expectation that teachers will include whole child considerations when planning such as differentiation, special education, English language learning, dual language, gifted and talented, social emotional learning, physical activity, and wellness.

Model Lesson- [Investigating Energy](#)

- Investigating Energy
- Investigating Light Energy
- Investigation Heat Energy
- Investigating Sound Energy

Suggested Pacing: (10 days)

TEKS:1.6A

Model Lesson- [Investigating Magnetic Energy](#)

- Investigation Magnetic Energy

Suggested Pacing: (2 days)

TEKS: 1.6B

Model Lesson- [Investigating Motion](#)

- Investigating Motion: Straight Lines and Zigzags
- Investigating Motion: Back and Forth/Up and Down
- Investigating Motion: Round and Round

Suggested Pacing: (8 days)

TEKS: 1.6C, 1.6D