

Highland Park Science Curriculum Third Grade

4th 9 weeks

Components	
Unit Name	Force, Motion, and Energy
TEKS	<p>(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to:</p> <p>(A) demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat; and</p> <p>(B) Make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics.</p> <p>(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:</p> <p>(A) plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;</p> <p>(B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data;</p> <p>(C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;</p> <p>(D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations;</p> <p>(E) demonstrate that repeated investigations may increase the reliability of results; and</p> <p>(F) Communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.</p> <p>(3) Scientific investigation and reasoning. The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:</p> <p>(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;</p> <p>(D) Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.</p> <p>(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The</p>

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	<p>student is expected to:</p> <p>(A) collect, record, and analyze information using tools, including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, compasses, magnets, collecting nets, notebooks, sound recorders, and Sun, Earth, and Moon system models; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums; and</p> <p>(B) Use safety equipment as appropriate, including safety goggles and gloves.</p> <p>(6) Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms. The student is expected to:</p> <p>(A) explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life;</p> <p>(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons; and</p> <p>(C) Observe forces such as magnetism and gravity acting on objects.</p>
Generalizations/ Enduring Understandings	<p>Students will know that there are different forms of energy including mechanical, light, sound, heat /thermal.</p> <p>Students will demonstrate and observe how position and motion of objects can be changed by pushing and pulling objects shows work.</p> <p>Students will observe forces acting on objects. (gravity and magnetism)</p>
Concepts	<p>balance, balanced forces, force, interact, mass, matter, motion, pendulum, power, resist, thrust, inertia measure, acceleration, action, attract, drag, friction, speed, chemical energy, conservation of energy, energy, energy (organisms), energy (physical), fossil fuels, fuel, gas, heat, kinetic energy, light, mechanical energy, nuclear energy, potential energy, power, radiant energy, radiation, sound, sound wave, transmit, wavelength</p>
Guiding/ Essential Questions	<ol style="list-style-type: none"> 1. What makes something move or stop moving? 2. Why do some things move faster than others? 3. What is a force and how does it cause change? 4. How does a force cause change? 5. What causes a change in motion? 6. How can you tell whether an action is work?

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Learning Targets	<p>The students will explore the uses of various types of energy.</p> <p>ELA Connection: collect information from multiple sources of information</p> <p>The students will demonstrate the flow of electricity in circuits.</p> <p>The students will experiment with force and its effects on objects.</p>
Formative/ Summative Assessment	<p>Discovery Education Assessments:</p> <p>Forces, Motion, and Energy: http://tools.discoveryeducation.com/assessment/viewAssessment.cfm?guidAssetID=965a1410-f26f-4363-bffe-11ce5cc92488&blnPopup=1</p>

Processes and Skills	<ol style="list-style-type: none"> 1. Collect information through measuring 2. Construct graphs, tables, and charts and record data 3. Infer 4. Communicate results 5. Hypothesize 6. Control variables 7. Investigate how things move. 8. 11. Predict
Topics	<p>On the Move!</p> <p>Pushes and Pulls</p> <p>Forces in Motion</p>

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	<p>Doing Work</p> <p>Getting Work Done</p>
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Facts	<ul style="list-style-type: none"> • A force is a push or a pull on an object. • When the position of an object changes, we say the object is in motion. • Speed is a measure of how fast an object changes position and can be measured. • The characteristic of objects to resist a change in their motion is known as inertia. • All objects exert a gravitational force on each other and proportional to their masses and the distance between the two objects. • Work is being done when a force causes a change in an object's motion. • Energy is usually defined as the ability to do work.
Language of Instruction	<p>Position, motion, speed, force, gravity, weight</p> <p>Friction, work, energy</p>
Resources	
Interactive	<ul style="list-style-type: none"> • Explain Volume Displacement. • Compare light, sound, energy using a Venn Diagram

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Science Notebook	<ul style="list-style-type: none"> • Find three levers in your classroom and explain how they make your work load easier. • Explain how two magnets attract and repel. • Design a simple machine pulley system.
Student Investigations/ Student Products	Week Thirty-One: Vista: “ Tall Tales/Toy Company” – Learning Experience 1

Core Labs	<ul style="list-style-type: none"> • Volume –Mass/Matter • Energy-Light, Optics and Sound • Magnetism • Simple Machines- • Push and Pull/Kick the Bucket • Simple Machines- • Lever-Lego-#4 & 8 • Simple Machines- • Wheel and Axle- Lego #10 & 11 • Simple Machines- • Pulley-Fixed and Movable/ Milk a Mammoth • Simple Machines-Inclined Planes • Science Extravaganza
Core Lab Extension	<p>Matter: Compare and contrast the mass and the volume of at least two of the items that you measured. (Be sure to write in complete sentences. If time permits, make a positive comment to two classmates' work.)</p> <p>The attached videos may be helpful in providing additional information about mass and volume.</p> <p>Mass: http://www.brainpopjr.com/math/measurement/gramsandkilograms/</p> <p>Volume: http://studyjams.scholastic.com/studyjams/jams/math/measurement/volume.htm</p>

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	<p>Energy-Lights, Optics, Sound: Energy exists in many forms. How are the following used in everyday life: light energy, sound energy, mechanical energy and heat/thermal energy?</p> <p>Light Energy Video: http://www.brainpopjr.com/science/energy/light/</p> <p>Sound Energy Video: http://www.brainpopjr.com/science/energy/sound/</p> <p>Properties of Matter-Magnetism: Matter has measurable physical properties such as magnetism. In lab, you had opportunities to investigate magnetism. Write about your learning. http://www.brainpopjr.com/science/forces/magnets/</p> <p>Position and Motion can be Changed/Simple Machines/Push and Pull, Kick the Bucket: Forces can cause change, and energy exists in many forms. During "Kick the Bucket", you and your group explored how the position and the motion of the bucket and block were changed. Explain how work was being done in your repeated investigations.</p> <p>Video One: Measuring Work http://www.brainpop.com/science/motionsforcesandtime/work/</p> <p>Video Two: Pushes, Pulls, Position, and Motion http://www.brainpopjr.com/science/forces/pushesandpulls/</p> <p>Simple Machines/Position and Motion Can Be Changed With A Lever: How can the position and the motion of an object be changed with a lever? http://www.brainpop.com/technology/simplemachines/levers/</p> <p>Simple Machines/Wheel and Axle: How was the position of the object changed when you pulled or pushed the object that had the wheel and axle? http://safari.hpsid.org/?a=224691&ch=6&d=28805AA</p> <p>Simple Machines/Pulley Fixed and Movable/Milk A Mammoth: How did the fixed and movable pulleys change the position and motion of objects by pulling objects to show that work was being done? http://safari.hpsid.org/?a=1684&ch=3&d=01445AA</p>
Snapshots (Dana Center)	<p>3.5 (B) Observe and manipulate a flashlight, toy car, or truck. Identify and describe parts and their functions.</p> <p>3.6 (A) Using a ramp with adjustable height allow a sphere to roll down and hit an object. Measure and record the changes in position and direction of motion of the object to which the push had been applied. Repeat with the ramp at a different height or location.</p>

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experiences/labs)	
Booklist	<p>Energy: Heat, Light and Fuel by Darlene R. Stille</p> <p>Energy Heat: Heat wave by Helen Ketteman Snowed in with Grandmother Silk by Carol Fenner</p> <p>Energy Light: My Light by Molly Bang All About Light by Lisa Trumbauer</p> <p>Energy Sound: Little Beaver and the Echo by Amy MacDonald Bravo, Maurice by Rebecca Bond</p> <p>Magnetism: Amazing Magnetism by Rebecca Carmi (Chapter Book) What Makes a Magnet? by Franklyn M. Branley</p> <p>Pushes and Pulls (Motion and Position): Forces Make Things Move by Kimberly Brubaker Bradley The Magic School Bus Plays Ball: A Book About Forces by Joanna Cole Push and Pull by Patricia J. Murphy</p>
Textbook Correlation	<p>Unit: Force, Motion, and Energy</p> <ul style="list-style-type: none"> • About Force- Throwing a snowball means applying a force against it. Throwing it harder causes a great change in its motion. When the snowball hits you, it slows down. Slowing an object down requires a force to change its motion. In this concept, you'll discover that whether you are throwing a snowball or slowing it down with your body, forces are at work. (Sessions 1-5) • Describing Motion- Think about a rocket flying in the sky. How would you describe its motion? Since the motion of most objects is the same everywhere, a spaceship in space should move just like a rocket on Earth. In this concept, you'll learn about motion and what makes things move. (Sessions 1-3) • Changing the Speed of Motion- Perhaps you remember what your teacher said once demonstrated: A toy car's motion changes when there is a change on the force acting on the car. In this concept, you'll discover that velocity is the speed of the car in a particular

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	<p>direction. (Sessions 1-4)</p> <ul style="list-style-type: none"> • Changing Direction- Controlling a ball's motion is an important part of sports like tennis, basketball, softball, football, golf, and even bowling. In each sport, players must constantly change the ball's direction. In this concept, you'll learn more about how objects move and why they change direction. (Sessions 1-2) • Forms of Energy-Wind, turning on a computer, charging a battery, talking, and playing music seem very different. But they all use forms of energy. In this concept, you'll learn about energy in all its forms. (Sessions 1-3)
<p>Challenge/ Extension</p>	<p>Fundamentals from Discovery Techbook</p>
<p>Health: Coordinated School Health Program</p>	<p><u><i>Healthy and Wise: Elementary Online</i></u>; Monthly Newspaper- Sports, Exercise, Food, Health Research/Updates, Body Basics, Safety/Health Awareness, Relationships/Social/ Mental Health www.caprockpress.com</p> <p>Grade 3 Health Textbook http://www.macmillanmh.com/health/2005/student/level1.php?isbn=002280384X&st=tx</p>
<p>Health TEKS</p>	<p>6) Influencing factors. The student understands factors that influence individual and community health. The student is expected to:</p> <p>(A) relate how protecting the environment promotes individual and community health;</p> <p>(B) identify common health problems that result from unhealthy environments such as skin cancer, poisoning, and respiratory illness;</p> <p>(D) Describe roles and responsibilities of family members in promoting and practicing health behaviors.</p> <p>(7) Influencing factors. The student comprehends ways in which media and technology influence individual and community health. The student is expected to:</p> <p>(A) describe how the media can influence knowledge and health behaviors; and</p> <p>(B) Identify ways in which health care has improved as a result of technology.</p> <p>(8) Personal/interpersonal skills. The student understands how relationships can positively and negatively influence individual and community health. The student is expected to:</p> <p>(B) Describe ways in which peers and families can work together to build a healthy community.</p> <p>(11) Personal/interpersonal skills. The student recognizes critical-thinking, decision-making, goal-setting, and problem-solving skills for making health-promoting decisions. The student is expected to:</p> <p>(A) practice critical-thinking skills when making health decisions;</p> <p>(B) gather data to help make informed health choices;</p>

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	<p>(C) explain the positive and negative consequences of making a health-related choice; (D) explain the importance of seeking assistance in making decisions about health;</p>
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