

**Toms River Science Curriculum**

Board Approved: April 2016

**Course:** Earth Sciences

**Grade Level:** Third

**Title of Unit:** Weather and Climate

**Stage 1 - Desired Results**

**Understandings:**

*Students will understand that.....*

- data in tables and graphs can illustrate typical weather conditions expected during a particular season
- climates in different regions of the world can follow patterns
- there are ways to design solutions that reduce the impact of a weather-related hazard

**Essential Questions:**

- What is the weather in different parts of the world and during different times of the year?
- How can the impact of weather related hazards be reduced?

**Knowledge:**

*Students will know....*

- scientists record patterns of the weather in order to make predictions about what kind of weather might happen next
- climate describes an area's typical weather conditions and the changes over many years
- many different kinds of natural hazards occur in nature
- although we cannot eliminate natural hazards, we can take steps to reduce their impact

**Skills:**

*Students will be able to....*

- create tables and graphs that show weather patterns
- describe and investigate the climate in different areas of the world
- make predictions about the climate based on the previous observations
- design a solution to reduce the impact of weather-related hazards

**Standards:** (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21<sup>st</sup>-century life and careers.)

**NGSS:**

- 3-ESS2-1 - Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season
- 3-ESS2-2 - Obtain and combine information to describe climates in different regions of the world
- 3-ESS3.1 - Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard

**CCSS: ELA**

- R3.1 - Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers
- R3.9 - Compare and contrast the most important points and key details presented in two texts on the same topic

- W3.1 - Write opinion pieces on topics or texts, supporting a point of view with reasons
- W3.7 - Conduct short research projects that build knowledge about a topic
- W3.8 - Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

CCSS: Mathematics

- 3.MD.A.2 - Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 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
- 3.MD.B.3 - Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs

**Stage 2- Assessment Evidence:**

**Performance Tasks and other evidence:**

- written responses to thinking questions STEM activities - engineering challenge results and explanations
- lab/exploration results
- quizzes

**Stage 3 – Learning Plan**

**Learning Activities:**

- Thundercake by Patricia Polacco - <https://www.youtube.com/watch?v=YhhtKGCsAyY>
- A Time of Wonder by Robert McCloskey
- Hurricane by David Weisner <https://www.youtube.com/watch?v=Sw7qzB12HCg>
- Bringing the Rain to Kapiti Plain by Velma Aardema [https://www.youtube.com/watch?v=14\\_E5EQDqBY](https://www.youtube.com/watch?v=14_E5EQDqBY)
- Feel the Wind by Arthur Duros
- Hide and Seek Fog by Alvin Tresselt
- Schoolwide- What Will Weather Be?
- Schoolwide- Weather Patterns
- Schoolwide- Temperature
- Scholastic Anthology- Tornado
- Engineering Adventures, [www.EIE.org](http://www.EIE.org) - "To the Rescue - Engineering Aid Drop Packages" - & accompanying Student Journal. While travelling in Thailand, Jacob and India learn that monsoon rains can cause severe flooding that cuts people off from important supplies. Kids will help Jacob and India engineer "aid drop packages" that can be dropped from an aircraft, protect what's inside, and are easy to find once they reach the ground - **see preview included in teacher binder**
- Science probes - simple activities that explore student knowledge prior to study of a topic - the teacher pages explain common misconceptions that students may have and how to correct them through activities - **all of the below listed probes are included in teacher binder**
  - What are Clouds Made Of? - ideas about clouds
  - Rainfall - ideas about precipitation
  - The Mitten Problem - ideas about the source of heat
  - Beach Sand - ideas about weathering, erosion, and landforms
  - Wet Jeans - ideas about where water goes after it evaporates
  - Where Did the Water Come From? - ideas about condensation
  - Summer Talk - ideas about the seasons

- **“The Slippery Glass”** - short mystery - exploration that explores concept of condensation - **included in teacher binder**
- Create a weather station [www.ciese.org/curriculum/weatherproj2/en/activity1.shtml](http://www.ciese.org/curriculum/weatherproj2/en/activity1.shtml)
- Mystery Science Website - The World of Weather
  - Lesson 1 - Water Cycle, Phases of Matter - “Where do Clouds Come From?”
  - Lesson 2 - Local Weather Patterns, Weather Predictions - “How Can We Predict When It’s Going to Storm?”
  - Lesson 3 - Climate, Geography, and Global Weather Patterns - “Why Are Some Places Always Hot?”
  - <https://mysteryscience.com/weather/weather-climate-water-cycle#anchor>
- Cloud Finder Wheel [www.scholastic.com/lessonrepro/reproducibles/profbooks/cloudkey.pdf](http://www.scholastic.com/lessonrepro/reproducibles/profbooks/cloudkey.pdf)
- Weather related experiments [www.weatherwhizkids.com](http://www.weatherwhizkids.com)
- The Water Cycle Song <https://www.youtube.com/watch?v=TWb4KIM2vts>
- Water Cycle QR codes
- National Weather Service- to predict severe weather <http://www.weather.gov/>
- National Geographic-natural disaster videos <http://environment.nationalgeographic.com/environment/natural-disasters/>
- How Do Tornadoes Form? (video) <http://ed.ted.com/lessons/how-do-tornadoes-form-james-spann>
- The Weather Classroom’s “Elementary Weather” Teacher’s Guide [http://www.myips.org/cms/lib8/IN01906626/Centricity/Domain/8123/ElementaryWeather\\_new.pdf](http://www.myips.org/cms/lib8/IN01906626/Centricity/Domain/8123/ElementaryWeather_new.pdf)

**Modifications:** (ELLs, Special Education, Gifted and Talented)

- \* Follow all IEP modifications/504 plan
- \* Teacher tutoring
- \* Peer tutoring
- \* Cooperative learning groups
- \* Modified assignments
- \* Differentiated instruction

Presentation accommodations allow a student to:

- \* Listen to audio recordings instead of reading text
- \* Learn content from audiobooks, movies, videos and digital media instead of reading print versions
- \* Work with fewer items per page or line and/or materials in a larger print size
- \* Have a designated reader
- \* Hear instructions orally
- \* Record a lesson, instead of taking notes
- \* Have another student share class notes with him
- \* Be given an outline of a lesson
- \* Use visual presentations of verbal material, such as word webs and visual organizers
- \* Be given a written list of instructions

Response accommodations allow a student to:

- \* Give responses in a form (oral or written) that’s easier for him
- \* Dictate answers to a scribe
- \* Capture responses on an audio recorder
- \* Use a spelling dictionary or electronic spell-checker
- \* Use a word processor to type notes or give responses in class
- \* Use a calculator or table of “math facts”

Setting accommodations allow a student to:

- \* Work or take a test in a different setting, such as a quiet room with few distractions
- \* Sit where he learns best (for example, near the teacher)

- \* Use special lighting or acoustics
- \* Take a test in small group setting
- \* Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)

Timing accommodations allow a student to:

- \* Take more time to complete a task or a test
- \* Have extra time to process oral information and directions
- \* Take frequent breaks, such as after completing a task

Scheduling accommodations allow a student to:

- \* Take more time to complete a project
- \* Take a test in several timed sessions or over several days
- \* Take sections of a test in a different order
- \* Take a test at a specific time of day

Organization skills accommodations allow a student to:

- \* Use an alarm to help with time management
- \* Mark texts with a highlighter
- \* Have help coordinating assignments in a book or planner
- \* Receive study skills instruction

Assignment modifications allow a student to:

- \* Complete fewer or different homework problems than peers
- \* Write shorter papers
- \* Answer fewer or different test questions
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Curriculum modifications allow a student to:

- \* Learn different material (such as continuing to work on multiplication while classmates move on to fractions)
- \* Get graded or assessed using a different standard than the one for classmates

**Notes:** Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

<b>Course:</b> Life Sciences <b>Grade Level:</b> 3 <sup>rd</sup> Grade	<b>Title of Unit:</b> Interdependent Relationships in Ecosystems
<b>Stage 1 - Desired Results</b>	
<b>Understandings:</b>  <i>Students will understand that.....</i> <ul style="list-style-type: none"> <li>● that some animals form groups that help group members survive</li> <li>● data from fossils can provide evidence of the organisms and the environments in which they lived long ago</li> <li>● in a particular habitat some organisms can survive well, while some survive less well, and others cannot survive at all</li> <li>● when an environment changes, the types of plants and animals that live in it may change, and a variety of solutions may be used to solve this problem. Each of these possibilities may have advantages and disadvantages.</li> </ul>	<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>● What happens to plants and animals when their environment changes?</li> <li>● How are plants, animals, and environments of the past similar or different from current plants, animals, and environments?</li> <li>● How can fossils provide evidence that animals and plants have changed over time?</li> </ul>
<b>Knowledge:</b>  <i>Students will know.....</i> <ul style="list-style-type: none"> <li>● being part of a group helps animals obtain food, defend themselves, and cope with changes</li> <li>● there are different reasons for groups</li> <li>● some kinds of plants and animals that once lived on Earth are no longer found anywhere</li> <li>● fossils provide evidence about the types of organisms and environments from long ago</li> <li>● explain with evidence how some habitats allow animals to survive or die out</li> <li>● environmental changes cause organisms to survive and reproduce, move to new locations, and die out</li> <li>● animals live in a variety of habitats and change in those habitats to fit in them</li> </ul>	<b>Skills:</b>  <i>Students will be able to....</i> <ul style="list-style-type: none"> <li>● create an argument with evidence that shows how animals form groups to survive</li> <li>● use fossils to make connections between how animals lived long ago and how they live today</li> <li>● explain with evidence how some habitats allow animals to survive and flourish or die out. Explain how environmental changes affect the animals that live in the environment</li> </ul>

**Standards:** (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21<sup>st</sup>-century life and careers.)

**NGSS:**

- 3-LS2-1 - Construct an argument that some animals form groups that help members survive
- 3-LS4-1 - Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago
- 3-LS4-3 - Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all
- 3LS4-4 - Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change

**CCSS: ELA**

- RI.3.1 - Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers
- RI.3.2 - Determine the main idea of a text; recount the key details and explain how they support the main idea
- 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
- W.3.1 - Write opinion pieces on topics or texts, supporting a point of view with reasons
- W.3.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly
- 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
- SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace

**CCSS: Mathematics**

- 3.NBT.A.1 - Use place value understanding to round whole numbers to the nearest 10 or 100
- 3.NBT.A.2 - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction
- 3.NBT.A.3 - Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g.,  $9 \times 80$ ,  $5 \times 60$ ) using strategies based on place value and properties of operations
- 3.MD.B.3 - Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs
- 3.MD.B.4 - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters

**Stage 2- Assessment Evidence:**

**Performance Tasks and other evidence:**

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**Stage 3 – Learning Plan**

## Learning Activities:

- Opening activity: observe and identify components of an ecosystem - 5 m circle on ground, observe and record observations of everything in your ecosystem, take small samples of everything in a bag, discuss importance of each item in the bag
- Read: Oil Spill by Melvin Burger -
  - Do the experiment - "Cleaning bird feathers in oil" - **lab pages included in teacher binder**
  - Coat 4 feathers in Crisco, place into 4 different cups containing laundry detergent, shampoo, hand soap and dish detergent. Discussion questions: Which soap will work best to remove oil from bird feathers?
- [Hop to It: Safe Removal of an Invasive Species - Engineering is Elementary - Engineering Adventure](#) - Oh no! India and Jacob accidentally brought a cane toad from Australia to New Zealand. Cane toads are pests. They're an invasive species that hurts native species in Australia—and they could do the same in New Zealand. Kids will help India and Jacob engineer a humane trap to catch the toad. - **see preview included in teacher binder**
- Scholastic Tradebook- Turtle Watch
- Scholastic Anthology- Dragon in the Rocks
- Scholastic Anthology- Wild and Woolly Mammoths
- Scholastic Anthology- Fire! In Yellowstone
- Schoolwide Library - What Happened to the Dinosaurs?
- Just a Dream by Chris Van Allsburg
- Down the Drain: Conserving Water by Anita Ganieri and Chris Oxlade (book) - **activity included in teacher binder** - students keep track of water use for a day, explore ways to conserve water, and create a Water Watch campaign - to understand that clean water is limited in some places on Earth and the consequences of poor water quality on people, plants, and animals
- Rice is Life by Rita Golden Gelman (book) - **activity included in teacher binder** - explore the importance of rice as a food source, the differences among types of rice, the life cycle of rice, and rice production methods - explore controls, variable, and experimental design by investigating how rice grows and by designing their own plant growth experiments
- Science probes - simple activities that explore student knowledge prior to study of a topic - the teacher pages explain common misconceptions that students may have and how to correct them through activities - **all of the below listed probes are included in teacher binder**
  - Habitat Change - ideas about adaptations
  - Mountaintop Fossil - ideas about mountain formation & location of fossils
  - Plants in the Dark and Light - ideas about plant growth
- [Life as a Plant - Plant adaptations. Multi-media and activities](#) - video and explanation about plant life in the desert/adaptations
- [kidsdiscover.com](#)-explore various science topics such as ecosystems, plants, and animals
- [studyjams.scholastic.com](#)
- environmental adaptations activity - storing water - wet 2 paper towels, wrap one in wax paper, observe and record observations after a day - discussion questions: How does each paper towel feel? How does the waxy skin help desert animals survive? What would happen if there were environmental and/or physical changes? (food sources, weather, etc.)
- Mystery Science Website - Animals Through Time
  - Lesson 1 - Habitats & Environmental Change
  - Lesson 2 - Structures & Adaptations, Fossil Evidence, & Classification
  - Lesson 3 - Fossil Evidence & Behavior
  - <https://mysteryscience.com/animals/habitats-heredity-change-over-time#anchor>

## Plant Adventures

- Lesson 4 - Adaptations & Habitat
- Lesson 5 - Adaptations & Habitat

- <https://mysteryscience.com/plants/structure-function-adaptations#anchor>
- [Use the Engineering Design Process to build a model biodome of a particular environment.](#)
- plant dependence on water - students explore 3 plants with different amounts of water and decide how the plants will change over time - make predictions about which plant will grow the tallest/shortest - discussion questions: How did the plants change over time? What happens to some plants when there is a flood?

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<b>Course: Science</b> <b>Grade Level: 3<sup>rd</sup> Grade</b>	<b>Title of Unit: Inheritance and Variation of Traits: Life Cycles and Traits</b>
<b>Stage 1 - Desired Results</b>	
<b>Understandings:</b>  <i>Students will understand that.....</i> <ul style="list-style-type: none"> <li>● organisms have unique and diverse life cycles but they all have these things in common: birth, growth, reproduction, and death</li> <li>● data can provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms</li> <li>● evidence supports the explanation that traits can be influenced by the environment</li> <li>● evidence can be used to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing</li> </ul>	<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>● How do organisms vary in their traits?</li> <li>● What kinds of traits are passed from parents to offspring?</li> </ul>
<b>Knowledge:</b>  <i>Students will know.....</i> <ul style="list-style-type: none"> <li>● plants and animals have unique and diverse life cycles</li> <li>● plants and animals inherit traits from their parents</li> <li>● traits of plants and animals can change to adapt to the environment; changes can range from diet to learning abilities.</li> <li>● plants and animals look and act differently as a result of environmental and/or inherited traits</li> <li>● variations of traits help plants and animals survive, choose mates, and reproduce in specific ways</li> </ul>	<b>Skills:</b>  <i>Students will be able to....</i> <ul style="list-style-type: none"> <li>● plants and animals have different life cycles, but share similarities in birth, growth, reproduction, and death</li> <li>● collect and analyze data to give evidence that plants and animals have traits that are passed down from parents</li> <li>● similar plants and animals share traits but also have differences</li> <li>● use evidence to show how traits can be influenced by the environment</li> <li>● show how variations of traits help plants and animals survive, choose mates, and reproduce</li> </ul>
<b>Standards:</b> (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21 <sup>st</sup> -century life and careers.)  <b>NGSS:</b> <ul style="list-style-type: none"> <li>● 3-LS1-1 - Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death</li> <li>● 3-LS3-1 - Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms</li> </ul>	

- 3-LS3-2 - Use evidence to support the explanation that traits can be influenced by the environment
- 3-LS4-2 - Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing

CCSS: ELA

- RI.3.1 - Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers
- RI.3.2 - Determine the main idea of a text; recount the key details and explain how they support the main idea
- 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
- RI.3.7 - Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur)
- W.3.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly
- SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace
- SL.3.5 - Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details

CCSS: Mathematics

- 3.MD.B.3 - Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs
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**Stage 2- Assessment Evidence:**

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**Stage 3 – Learning Plan**

**Learning Activities:**

- What if You Had Animal Teeth? by Sarah Markle ([YouTube Version](#) read aloud)
- What if You Had Animal Hair? by Sarah Markle
  - [Student Response Page](#)
- What Do You Do With a Tail Like This? by Steve Jenkins ([Online read aloud](#))
- Schoolwide mentor text - *What are Camouflage and Mimicry?* ([Digital Version](#))
- Schoolwide mentor text- *A Butterfly is Patient* ([YouTube Version](#) read aloud)
- Growing Patterns by Sarah C. Campbell (investigating Fibonacci numbers in nature)
- STEM activity: Bird Beak Adaptations (refer to binder)

- Blubber Gloves (exploration) hands on investigation on how an animal's blubber or fat layer helps it to survive in a cold climate
- Predators and Prey M & M Survival Challenge (hands on activity) to hunt for M & M prey in a series of different habitats to discover which M & M's survive in each habitat and why [www.sciencebuddies.org](http://www.sciencebuddies.org)
- Dissect lilies/carnations to investigate plant reproduction
- Plant life cycle-hands on activity to observe the life cycle of a plant in a ziploc bag
- Butterfly life cycle-ongoing, hands on activity to observe the life cycle of a butterfly [www.iinsectlore.com](http://www.iinsectlore.com)
- A Tiny Seed by Eric Carle
  - <https://www.youtube.com/watch?v=VSFNR777V0A>
  - <https://www.youtube.com/watch?v=ls6wTeT2cKA>
  - [Project Learning Tree Lesson:](#)
- "Engineering a Frog" - engineering challenge - students will engineer a new species of frog to adapt to a specified environment and complete an informational essay - **activity included in teacher binder**
- EIE: Just Passing Through: Designing Model Membranes <http://www.eiestore.com/designing-model-membranes-unit.htm>
- Engineering design challenge - start with book, *The Mixed Up Chameleon* by Eric Carle - investigate and explore animal adaptations, then students will take an idea or drawing and design a moving part for their animal or will make sure that their animal's structure can function as it was intended.(i.e. wings will support the animal so it can glide; tail with stinger can move from side to side to sting its prey; a dangling lure like a fishing pole; a claw that can open and close) - **see preview pages in teacher binder** - <http://www.cpalms.org/Public/PreviewResourceLesson/Preview/31239>
- Mystery Science Website - Animals Through Time
  - Lesson 4 - Heredity, Variation, & Selection
  - Lesson 5 - Heredity, Variation, & Selection
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<b>Course:</b> Physical Sciences <b>Grade Level:</b> Third	<b>Title of Unit:</b> Forces and Motion
<b>Stage 1 - Desired Results</b>	
<b>Understandings:</b>  <i>Students will understand that.....</i> <ul style="list-style-type: none"> <li>● an investigation can provide evidence of the effects of balanced and unbalanced forces on the motion of an object</li> <li>● observations and/or measurements of an object's motion can be used to provide evidence that a pattern can be used to predict future motion</li> <li>● there is a cause and effect relationship of electrical and magnetic interactions between two objects not in contact with each other</li> <li>● a simple design problem can be solved by applying scientific ideas about magnets</li> </ul>	<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>● How do equal and unequal forces on an object affect the object?</li> <li>● How can magnets be used?</li> </ul>
<b>Knowledge:</b>  <i>Students will know.....</i> <ul style="list-style-type: none"> <li>● a force can be a push or a pull</li> <li>● objects remain in motion or at rest until another force changes the direction or changes the speed</li> <li>● friction slows objects down</li> <li>● some changes in motion require objects to touch and some do not require objects to touch (electrical or magnetic forces)</li> <li>● magnets are attracted to some objects that contain certain metals</li> <li>● static electricity between hair and a balloon is an electrical force</li> </ul>	<b>Skills:</b>  <i>Students will be able to.....</i> <ul style="list-style-type: none"> <li>● give evidence of the effects of balanced and unbalanced forces on the motion of an object</li> <li>● collect measurement data to provide evidence of an object's motion</li> <li>● use data to predict future motion</li> <li>● demonstrate how two objects do not need to be in contact with each other to cause motion</li> <li>● define a simple design problem that can be solved by applying scientific ideas about magnets</li> </ul>
<b>Standards:</b> (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21 <sup>st</sup> -century life and careers.)  <b>NGSS:</b> <ul style="list-style-type: none"> <li>● 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</li> <li>● 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</li> <li>● 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</li> </ul>	

- 3-PS2-4 - Define a simple design problem that can be solved by applying scientific ideas about magnets

CCSS: ELA

- RI3.1 - Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers
- RI3.3 - 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
- RI3.8 - Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)
- W3.7 - Conduct short research projects that build knowledge about a topic
- W3.8 - Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories
- SL3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail

CCSS: Mathematics

- MD.A.2 - Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 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

## Stage 2- Assessment Evidence:

### Performance Tasks and other evidence:

- written responses to thinking questions
- STEM activities - engineering challenge results and explanations
- lab/exploration results
- quizzes

## Stage 3 – Learning Plan

### Learning Activities:

- “Paper airplanes” (exploration) How People Learned to Fly by Fran Hodgkins (book) – great intro activity – making and flying paper airplanes to explore the “vocabulary” of force – 2 days – collecting data about distance, force, adding paper clips in charts & writing explanations - **The Secrets of Flight activity included in teacher binder**
- “Sheep in a Jeep” (exploration) Sheep in a Jeep by Nancy E. Shaw (book) – **activity and lab pages included in teacher binder** – rolling cars down a ramp to explore the “vocabulary” of motion and friction with written explanation - try different surfaces & then obstacles at the bottom (connection to seat belts in a vehicle) - also website [http://www.macombscience.org/uploads/5/8/3/4/583452/sheep\\_in\\_a\\_jeep.pdf](http://www.macombscience.org/uploads/5/8/3/4/583452/sheep_in_a_jeep.pdf)
- Newton and Me by Lynne Mayer – (book) - to accompany Newton’s Laws of Motion activities
- “Roller coasters” – (Engineering design challenge) - build a coaster using pipe insulation split lengthwise and a marble, criteria for success – coaster must have 1 hill and 1 loop, when marble is released, the marble should travel through the entire coaster and fall into a cup at the end (Use engineering design process – Ask, Imagine, Plan, Create, Improve - Amy is playing checkers inside.)
- “Pendulum activity” – (exploration) – create a pendulum, make changes in the length of the string to explore & provide evidence that patterns can be used to predict future motion - <http://www.mccracken.kyschools.us/NGSS.aspx> and <http://pbskids.org/zoom/activities/sci/pendulumchallenge.html> -
- “Balloon rockets” – (exploration) - tie a piece of fishline with a straw on the string between 2 chairs, blow up a balloon but do not tie it off, hold the end while taping the balloon to the straw, then let go - students can measure the distance traveled and the time to travel the distance - <http://www.education.com/science-fair/article/volume-air-far-balloon-rocket-travels/>
- “Catapults” (marshmallows or candy) - (engineering) - <http://kidsactivitiesblog.com/55055/15-easy-catapults-to-make> -to build a catapult to launch marshmallows or candy - test for the furthest distance etc
- “Static electricity” – (exploration) – <http://www.enchantedlearning.com/physics/StaticElectricity.shtml> - rub a balloon on a piece of woolen fabric, predict what will happen when you put the balloon near your hair (creates static electricity), make and record observations, predict & record observations about what will happen when you put the balloon near a tin can - [mccracken.kyschools.us](http://www.mccracken.kyschools.us)
- “What is magnetic?” – (exploration) – <https://amandarussell71.wordpress.com/lessons/> -make a collection of items in a bag, predict which items will be magnetic, test with magnets, discuss which are and are not and why
- “Magnet stations” – (exploration) – 4 stations exploring like/unlike poles of magnets - [www.mccracken.kyschools.us/NGSS.aspx](http://www.mccracken.kyschools.us/NGSS.aspx) (great website ideas in all NGSS units)
- “Magnet races” (exploration)-use of magnets to create push or pull - <http://www.terrificscience.org/lessonpdfs/OffToTheRaces.pdf>
- “Toxic popcorn challenge” – (engineering design challenge) – <http://tryengineering.org/lesson-plans/toxic-popcorn-design-challenge> -design a product and process to safely remove “toxic”

popcorn and save the city - **see preview included in teacher binder**

- “Build a hovercraft” (engineering design challenge) – investigate friction by designing a hovercraft that will glide along without being slowed down)  
[https://www.teachengineering.org/view\\_activity.php?url=collection/cub\\_/activities/cub\\_mechanics/cub\\_mechanics\\_lesson05\\_activity1.xml](https://www.teachengineering.org/view_activity.php?url=collection/cub_/activities/cub_mechanics/cub_mechanics_lesson05_activity1.xml)
- “Bocce, Anyone” - short mystery - exploration that explores concept of patterns in rolling objects/games - **included in teacher binder**
- “The Magnet Derby” - short mystery - exploration that explores concept of magnets - strengths, attraction, and uses in everyday life, including toys - **included in teacher binder**
- Force & Motion - hands on, engaging activities, anchor charts & explorations -  
<https://drive.google.com/file/d/0B1EBJbKtMbf3ZXpUaWJxTXU5UzA/view?usp=sharing>
- Science probes - simple activities that explore student knowledge prior to study of a topic - the teacher pages explain common misconceptions that students may have and how to correct them through activities - **all of the below listed probes are included in teacher binder**
  - Rolling Marbles - ideas about motion on a ramp
  - Talking About Forces - ideas about forces
  - Does It Have to Touch? - ideas about whether forces have to touch to cause movement
  - Force & Motion Ideas - ideas about relationship between force and motion
  - Friction - ideas about friction
  - Pizza Dough - ideas about whether shape affects weight and mass of objects
  - Experiencing Gravity - ideas about gravity
  - Apple on the Ground - ideas about gravity
  - Apple on a Desk - ideas about balanced forces
  - Rolling Marbles (2) - ideas about circular motion
  - Dropping Balls - ideas about falling objects

**Modifications:** (ELLs, Special Education, Gifted and Talented)

- \* Follow all IEP modifications/504 plan
- \* Teacher tutoring
- \* Peer tutoring
- \* Cooperative learning groups
- \* Modified assignments
- \* Differentiated instruction

Presentation accommodations allow a student to:

- \* Listen to audio recordings instead of reading text
- \* Learn content from audiobooks, movies, videos and digital media instead of reading print versions
- \* Work with fewer items per page or line and/or materials in a larger print size
- \* Have a designated reader
- \* Hear instructions orally
- \* Record a lesson, instead of taking notes
- \* Have another student share class notes with him
- \* Be given an outline of a lesson
- \* Use visual presentations of verbal material, such as word webs and visual organizers
- \* Be given a written list of instructions

Response accommodations allow a student to:

- \* Give responses in a form (oral or written) that’s easier for him
- \* Dictate answers to a scribe
- \* Capture responses on an audio recorder
- \* Use a spelling dictionary or electronic spell-checker
- \* Use a word processor to type notes or give responses in class

- \* Use a calculator or table of "math facts"

Setting accommodations allow a student to:

- \* Work or take a test in a different setting, such as a quiet room with few distractions
- \* Sit where he learns best (for example, near the teacher)
- \* Use special lighting or acoustics
- \* Take a test in small group setting
- \* Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)

Timing accommodations allow a student to:

- \* Take more time to complete a task or a test
- \* Have extra time to process oral information and directions
- \* Take frequent breaks, such as after completing a task

Scheduling accommodations allow a student to:

- \* Take more time to complete a project
- \* Take a test in several timed sessions or over several days
- \* Take sections of a test in a different order
- \* Take a test at a specific time of day

Organization skills accommodations allow a student to:

- \* Use an alarm to help with time management
- \* Mark texts with a highlighter
- \* Have help coordinating assignments in a book or planner
- \* Receive study skills instruction

Assignment modifications allow a student to:

- \* Complete fewer or different homework problems than peers
- \* Write shorter papers
- \* Answer fewer or different test questions
- \* Create alternate projects or assignments

Curriculum modifications allow a student to:

- \* Learn different material (such as continuing to work on multiplication while classmates move on to fractions)
- \* Get graded or assessed using a different standard than the one for classmates

**Notes:** Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.