Grade K Science

Unit Title: Push, Pull, Go: September/October (MP 1)				
Big Idea: Motion and Force are observable every day.				
Investigation Questions	**NGSS/ PA Core Standards**	**Objectives/ Lab Activities**	**Key Vocabulary**	**Reading Wonders Connection**
LESSON 1: Push, Pull, Roll What Do You Know About Force and Motion? What Happens When You Roll a Ball? Can you Count and Sort Pieces to Build a Ramp? Can You Measure Distance?	**3.2.1.B1:** Demonstrate various types of motion. Observe and describe how pushes and pulls change the motion of objects. **3.2.K.A1:** Identify and classify objects by observable properties of matter. Compare different kinds of materials and discuss their uses. **S3.A.3.2.1:** Identify what models represent (e.g., simple maps showing mountains, valleys, lakes, and rivers; dioramas). **S.K-2.A.1.1.1:** Identify a scientific fact as something that can be observed using the five senses. **S.K-2.A.2.1.1:** Understand that making a change to an investigation may change the outcome(s) of the investigation. **S.K-2.A.2.1.2:** Describe outcomes of an investigation. **S.K-2.A.3.1.1:** Describe a system as being made of multiple parts that work together. **3.4.4.C2:** Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. **3.2.K.A6:** Asking questions and defining problems; Planning and carrying out investigations; analyzing and interpreting data. **3.2.K.A6:** Planning and carrying out investigations. **3.2.K.A6:** Asking questions and defining problems; Planning and carrying out investigations; Analyzing and Interpreting data.	Begin building an age-appropriate understanding of force and motion. Observe, measure, and record the change in position of an object over time. Explore the movement of a rolling ball and begin to build an understanding that motion is predictable (the ball travels in a straight line until a force stops it or changes its direction).	● Ball ● Bounce ● Energy ● Force ● Measure ● Motion ● Move ● Pull ● Push ● Ramp ● Roll	Unit 1 Week 3 ● How Can your senses help you learn? ● Solve problems through engineering. Unit 2 Week 1 ● How do tools help us explore? ● Solve problems thought engineering.
LESSON 2: Push, Pull, Swing How Does a Swing Move?		Explore changes in position and motion by pushing and pulling. Demonstrate that the greater the force (push or pull), the greater the change in motion. Begin to collect evidence about the invisible force of gravity.	● Force ● Motion ● Swing	Unit 1 Week 3 ● How Can your senses help you learn? ● Solve problems through engineering. Unit 2 Week 1 ● How do tools help us explore? ● Solve problems thought engineering.

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LESSON 3: Push, Pull, Tumble How Can I Make Dominos Tumble? What is a System?		Demonstrate that a force is any push or pull. Investigate and demonstrate that force causes an object to start moving, stop moving, or change direction. Predict and explore what happens if a component of a system in motion is missing or not working properly. 3.Build on the understanding that position and motion can be changed by pushing and pulling objects. Gather evidence that it takes a push or pull to change the motion of objects. 5.Build an understanding that objects move in different patterns (e.g., straight line, zigzag, curved line).	● Force ● Gravity ● Motion	Unit 1 Week 3 ● How Can your senses help you learn? ● Solve problems through engineering. Unit 2 Week 1 ● How do tools help us explore? ● Solve problems thought engineering.
LESSON 4: Push, Pull, Spin Have you Seen Something That Spins or Twirls? How Does a Top Spin?		Build on the concept that the greater the force applied to an object, the greater the change in the object's motion. Describe motion over time by exploring the motion—the slowing and the stopping—of a spinning top. Continue to compare patterns of movement such as sliding, rolling, and spinning.	● Balance ● Change ● Force ● Gravity ● Spin ● Tilt ● Twirl ● Twist ● Wobble	Unit 1 Week 3 ● How Can your senses help you learn? ● Solve problems through engineering. Unit 2 Week 1 ● How do tools help us explore? ● Solve problems thought engineering.

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		Begin building an understanding that it takes a force (a push or pull) to change the motion of objects.		
LESSON 5: Push, Pull, Invent Can you use a ball to tumble dominos? Can you combine systems to tumble dominos? How can we fix problems with our inventions? What have you learned about Force and Motion?		Apply concepts explored in Lessons 1–4 to build a motion invention (model) that works. Describe how force and motion work together in the model. Demonstrate the effect of missing or non working parts of a system. Evaluate learning from throughout the unit about force and motion, and compare that knowledge to initial ideas from the beginning of the unit.	● All vocabulary from previous lessons ● Invention	Unit 1 Week 3 ● How Can your senses help you learn? ● Solve problems through engineering. Unit 2 Week 1 ● How do tools help us explore? ● Solve problems thought engineering.

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Unit Title: Weather and Sky: March/April (MP 3)				
Big Idea: Weather is observable every day.				
Investigation Questions	**NGSS/ PA Core Standards**	**Objectives/ Lab Activities**	**Key Vocabulary**	**Reading Wonders Connection**
LESSON 1: Observing the Sky What do we know about weather? What can I observe in the daytime sky? What can I observe in the nighttime sky? How do the daytime and nighttime skies compare?	**3.2.K.B3:** Describe how temperature can affect the body. **3.2.1.B3:** Observe and record daily temperatures. Draw conclusions from daily temperature records as related to heating and cooling. **3.2.2.B2:** Explore and describe how different forms of energy cause changes. (e.g., sunlight, heat, wind) **3.3.K.A5:** Record daily weather conditions using simple charts and graphs Identify seasonal changes in the environment. Distinguish between types of precipitation. **3.3.1.A5:** Become familiar with weather instruments. Collect, describe, and record basic information about weather over time. **S.K-2.D.2.1.1:** Identify weather variables (i.e., temperature, wind speed, wind direction, and precipitation). **S.K-2.D.2.1.2:** Identify how weather conditions affect daily life. **3.2.K.A1:** Identify and classify objects by observable properties of matter. Compare different kinds of materials and discuss their uses. **S3.A.3.2.1:** Identify what models represent (e.g., simple maps showing mountains, valleys, lakes, and rivers; dioramas). **S.K-2.A.1.1.1:** Identify a scientific fact as something that can be observed using the five senses. **S.K-2.A.2.1.1:** Understand that making a change to an investigation may change the outcome(s) of the investigation. **S.K-2.A.2.1.2:** Describe outcomes of an investigation. **S.K-2.A.2.2.1:** Identify simple tools that can be used in an investigation (e.g., measuring cup, hand lens, ruler, balance scale, thermometer. **3.4.4.C2:** Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item.	Begin building an age-appropriate understanding about weather. Observe and record patterns and scale of objects that can be observed in the sky including clouds, Sun, and Moon. Describe the changes in temperature over the course of a day	● Atmosphere ● Daytime ● Earth ● Moon ● Nighttime ● Sun ● Sunrise ● Sunset ● Temperature ● Weather	Direct Connection Unit 6 – Weather for All Seasons ● Explore the climate and weather. ● Explore weather around us. ● Explore severe weather.
LESSON 2: Weather Watchers Can I describe temperature? Can I model precipitation? Can I identify cloud cover? Can I describe wind patterns? What can I observe about the weather today?		Describe activities that take place during specific weather conditions. Discuss the effects of weather on human activities. Observe and record daily weather changes. Identify patterns in weather features. Analyze and graph weekly weather data.	● Cloud cover ● Pattern ● Precipitation ● Temperature ● Weather forecast ● Weather reporter ● Wind	Direct Connection Unit 6 – Weather for All Seasons ● Explore the climate and weather. ● Explore weather around us. ● Explore severe weather.

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LESSON 3: Dangerous Weather How do we use weather patterns to understand dangerous weather? What happens when too much rain falls? How can wind turn into dangerous weather?	**3.2.K.A6:** Analyzing and Interpreting Data **3.2.K.A6:** Assessing Questions and Defining Problems; Developing and Using Models **3.2.K.A6:** Planning and Carrying Out Investigations **3.2.K.A6:** Analyzing and Interpreting Data; Constructing Explanations and Designing Solutions	Analyze collected weather data for patterns and connections. Use models to explain two types of dangerous weather, floods and tornadoes. Discuss weather safety and analyze ways to stay safe during a variety of weather conditions. Describe how weather forecasting can help people avoid the serious impacts of dangerous weather. Participate in a practice drill as a preventive measure for tornadoes.	● Absorb ● Dangerous weather ● Flood ● Hazard ● Hurricane ● Lightning ● Thunder ● Thunder storm ● Tornado ● Vortex	Direct Connection Unit 6 – Weather for All Seasons ● Explore the climate and weather. ● Explore weather around us. ● Explore severe weather.
LESSON 4: Warming the Earth How can we measure temperature? How does temperature change during the day? How does the sun change objects?		Identify a thermometer as a tool to measure temperature. Describe how temperature can change during the day. Identify the Sun as Earth's main source of light and heat. Explore how different materials can be affected by heat.	● Celsius ● Degrees ● Fahrenheit ● Thermometer	Direct Connection Unit 6 – ● Weather for All Seasons ● Explore the climate and weather. ● Explore weather around us. ● Explore severe weather.

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LESSON 5: In the Heat of the Sun How can I stay cool? Can we design and build something to block the sun's rays? How can we test and improve our structure? What have I learned about weather?		Describe the effects of the Sun on an object. Investigate, design, and build a structure to reduce the warming effect of sunlight on Earth's surface. Evaluate learning from throughout the unit about weather, and compare that knowledge to initial ideas from the beginning of the unit.	● Engineer ● All vocabulary from previous lessons	Direct Connection Unit 6 – Weather for All Seasons ● Explore the climate and weather. ● Explore weather around us. ● Explore severe weather.

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Unit Title: Living Things and Their Needs: April/May (MP 4)				
Big Idea: Our world includes living and nonliving things that interact in their environments.				
Investigation Questions	**NGSS/ PA Core Standards**	**Objectives/ Lab Activities**	**Key Vocabulary**	**Reading Wonders Connection**
LESSON 1: Living and Nonliving Things Is this thing living or nonliving? Will my seed grow? What are bessbugs? What can I learn about bessbugs?	**3.1.1.A1:** Categorize living and nonliving things by external characteristics. **3.1.1.A2:** Investigate the dependence of living things on the sun's energy, water, food/nutrients, air, living space, and shelter. **3.1.1.A5:** Identify and describe plant parts and their function. **3.1.1.B1:** Grow plants from seed and describe how they grow and change. Compare to adult plants. **3.1.2.A5:** Explain how different parts of a plant work together to make the organism function. **3.1.2.C2:** Explain that living things can only survive if their needs are being met. **3.4.4.C2:** Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. **S.K-2.B.1.1.1:** Describe basic external structures of animals and plants. **S.K-2.B.3.1.1:** Distinguish between living and nonliving things. **S.K-2.B.3.1.2:** Identify plants and animals as living things. **S4.B.2.2:** Identify that characteristics are inherited and, thus, offspring closely resemble their parents. **S.K-2.A.1.1.1:** Identify a scientific fact as something that can be observed using the five senses. **S.K-2.A.2.1.1:** Understand that making a change to an investigation may change the outcome(s) of the investigation. **S.K-2.A.2.1.2:** Describe outcomes of an investigation. **S.K-2.A.2.2.1:** Identify simple tools that can be used in an investigation (e.g., measuring cup, hand lens, ruler, balance scale, thermometer). **3.2.K.A6:** Constructing Explanations and Designing Solutions; Engaging in Argument From Evidence	Identify living and nonliving things. Make observations and describe the patterns of living things. Plant a pumpkin seed, and make predictions about what plants need to grow. Observe bessbugs and describe their habitat.	● Bessbug ● Classified ● Group ● Habitat ● Living ● Nonliving ● Observation ● Seed	● Wonders Unit 7 – The Animal Kingdom ● Explore what animals need to grow and live. ● Same in Unit 2 Week 3 – Bugs. Bugs, Bugs ● Unit 5 Week 1 and 2 – How does your garden grow. ● Explore how plants get what they need to grow. ● Observe what plants need to survive.
LESSON 2: Needs of Living Things What do plants need? What do bessbugs like? Did my plant grow?		.Observe and identify the needs of living things. Make predictions about the growth of plants in different conditions. Determine the habitat preferences of bessbugs. Monitor and collect data about plants.	● Control ● Data ● Experiment ● Grow ● Prediction ● Preference ● Seedling	● Wonders Unit 7 – The Animal Kingdom ● Explore what animals need to grow and live. ● Same in Unit 2 Week 3 – Bugs. Bugs, Bugs ● Unit 5 Week 1 and 2 – How does your garden grow. ● Explore how plants get what they need to grow. ● Observe what plants need to survive.

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LESSON 3: Living things and their environment What is an environment? Has our local environment changed? Did my plant grow bigger?	**3.2.K.A6:** Developing and Using Models; Constructing Explanations and Designing Solutions; Engaging in Argument From Evidence **3.2.K.A6:** Obtaining, Evaluating and Communicating Information **3.2.K.A6:** Engaging in Argument From Evidence; Obtaining, Evaluating and Communicating Information **3.2.K.A6:** Constructing Explanations and Designing Solutions; Engaging in Argument From Evidence	Describe the needs of living things and explain how the environment provides them. Observe different environments and identify the relationships among plants, animals, and their surroundings. Use evidence and observations to draw a model of how a plant or an animal interacts with its environment. Monitor and collect data about plants.	● Change ● Conclude ● Different ● Environment ● Observation	● Wonders Unit 7 – The Animal Kingdom ● Explore what animals need to grow and live. ● Same in Unit 2 Week 3 – Bugs. Bugs, Bugs ● Unit 5 Week 1 and 2 – How does your garden grow. ● Explore how plants get what they need to grow. ● Observe what plants need to survive.
LESSON 4: Protecting the Environment What do living things need? How big did my plant grow? How do humans impact the environment? Can I design a solution to protect the environment?		Monitor and collect data about plants to draw conclusions about their growth. Review the needs of living things and how living things change the environment. Discuss ways that humans impact their local environment. Design solutions to reduce human impact on the local environment.	● Solution	● Wonders Unit 7 – The Animal Kingdom ● Explore what animals need to grow and live. ● Same in Unit 2 Week 3 – Bugs. Bugs, Bugs ● Unit 5 Week 1 and 2 – How does your garden grow. ● Explore how plants get what they need to grow. ● Observe what plants need to survive.