Grade 3 Unit 2 Phenomena Wall

	Anchor Phenomenon: Objects move in different ways during physical activities on the playground (Playground Forces - Swing Example)
	Essential Question: How can we combine forces to create balance?
	Performance Expectations ● **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. ● **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. ● **3-PS2-3:** Ask questions to determine cause/effect relationships of electric or magnetic interactions between two objects not in contact with each other. ● **3-PS2-4:** Define a simple design problem that can be solved by applying scientific ideas about magnets.

Investigative Phenomenon	Question to Investigate	What We Did	What We Figured Out	Connection to Phenomenon	Questions We Now Have
Lesson 1 A ball moves when we throw, bounce or roll it. Forces have strength and direction.	What causes objects to move?	We explored the motion of a ball as we threw, bounced or rolled it around our circle. We combined forces and made models (drawings) of the ball before, at the moment of, during and after motion. We looked for similarities, differences and patterns in our models. We also created individual models of a swing before, at the moment of, during and after motion.	We can make an object move by applying a force. Forces have strength and direction. A force is a push and pull. We can make objects move by applying a force.	There is a moment before motion, the moment motion starts, moments of motion and a moment when motion stops. We looked for these moments in our anchor phenomenon - a child being pushed on a swing.	What forces make an object slow down and stop?
Lesson 2	What	We shared what we noticed	Forces have strength and	Pushing or pulling on the	Are there

Objects on the playground move. A force is a push and pull.	causes objects to move and NOT move?	and wondered about our first models of motion based on our observations of the swing. We identified interesting motion on the playground to observe. We went to the playground to record observations of motion as a group. In class, we practice capturing photos of before, at the moment of, during and after motion while throwing and catching a ball. Back on the playground we captured images of our objects on the playground at different stages of motion. We identified the forces at play!	direction. Gravity is a downward force pulling objects to the Earth. Friction is a force that can slow down the motion of a moving object. We can change the way objects move by increasing or decreasing the strength of a push. We can also change the direction of an object by pushing or pulling on it.	swing causes it to move. A stronger push causes the swing to swing higher. A softer push causes the swing to swing less for a shorter time. Gravity pulls down on the swing at all times. Friction between the swing and the air, and between the chain and attachment points causes the swing to slow down and eventually stop.	forces keeping an object still? What makes objects balance?
Lesson 3 We can balance ourselves, objects and systems using forces. Objects are not moving when they are balanced. A balanced object has equal forces acting on it.	How can we balance objects and ourselves?	We balanced a pencil on its tip. We explored different balancing exercises to feel what it's like to be balanced and unbalanced. We practiced mindfulness and meditation, tried balancing poses, balanced a book on one finger, balanced objects in a balance, played the teeter-totter simulation game and played the Scratch tug-of-war game.	You can tell an object is balanced when it is not moving. When an object is unbalanced, it moves. There are multiple forces acting on us and objects at all times. There needs to be equal forces pushing or pulling on an object to balance it around the balance point. When an object is still, it is balanced so there are equal forces pushing and	There are forces acting on the swing, even when it is not moving. When the swing is balanced, there are equal forces pushing and pulling on it. The swing is balanced when it is not moving. We can push down on the swing with an equal force that the chains pull up on the swing in order to be balanced on the swing. When the swing is moving, it is unbalanced. There are	How much force does an object need to be balanced? How can we predict when an object is going to stop moving and be balanced?

		We came up with what it means for objects or systems to be balanced and unbalanced. We identified balanced and unbalanced moments in our playground photos.	pulling on it. A force needs to be applied to an object that is still in order to make it move. A force also needs to be applied to an object in motion in order to make it stop moving. We can use counterweights to balance a system.	unbalanced forces pushing the swing with strength and direction when it is moving.	
Lesson 4 A mobile balances multiple objects and forces. We can predict the future motion of an object in a mobile (when it will move and when it will be still).	How can we predict the motion of objects?	We made a mobile out of paper and tried to balance the objects. We balanced papers on our mobiles as a class and identified patterns and how to predict motion in our mobiles. We chose different objects to balance on our mobile with partners. We looked for patterns. We recorded data of when our mobiles were balanced or unbalanced and identified evidence of cause and effect from our data. We designed experiments to answer questions and test our predictions about motion on the playground.	We can predict future motion of objects by looking for patterns. Objects that pull with more force can move objects. If you put weight on one side of a mobile, you have to put an equal amount of weight on the other side to balance it, which scientists call a counterweight. We can use our understanding of forces to make predictions.	By looking at patterns of motion on the swing, we can predict motion. If we use more force to push someone on a swing, they will swing higher. It takes more force to push an adult on a swing than a small baby.	Can forces add up in different ways? Can we control forces and balance? How can we use balance to help us?
Lesson 5	How can we balance	We chose objects that represent us and made a	We learned about how artists use balanced forces	.	What other forces can't we

Calder is an artist who balanced multiple objects and forces to make mobiles into art. Forces add up in order to make a mobile balanced or unbalanced.	multiple objects on a mobile?	balanced Mobile Me art piece. We recorded data on a table to show how we balanced our mobiles. We looked for patterns in the data. Then, we chose how to best represent our mobile in a photo. We shared our photos with a partner and made a connection. Option: We used this knowledge to create a balanced Mobile WE.	to make mobiles. Artists and designers need to understand how to balance forces when making a mobile. Our data showed how we used counterweights to balance our mobiles. We can't see the forces in action when they are balanced. We learned about each other and made connections by sharing our Mobile Me's. We made a big classroom mobile and balanced our strengths and goals.		see? How can we use our knowledge of forces to solve problems?
Lesson 6 Magnetism is an invisible force. We can play and explore with forces (both visible and invisible).	How can we make objects move with invisible forces?	We explored ways to move objects without touching them. We planned and carried out an investigation with rolling spheres. We explored the properties of magnets. We designed our own investigation question and experiment to test the properties of magnets.	We can make objects move without touching them using different invisible forces like gravity and magnetism. Gravity pulls objects down to the earth. Some objects are attracted to magnets and some are not. Magnets have poles and different strengths and properties.	Gravity pulls down on the swing at all times, always pulling the swing back down to the earth. The invisible force of gravity is acting on all objects on earth at all times.	What other forces can't we see? How can we use our knowledge of forces to solve problems?

		We explained how our experiment answered or did not answer our question. We made connections with magnets. We labeled invisible forces on our playground models and looked for patterns in the effects of those invisible forces. We presented our playground forces models to the class and looked for patterns and connections.	We learned how our questions can guide our experiment. We discovered ways that we are connected and how we are unique. Visible and invisible forces are all around us in the classroom, on the playground and everywhere at all times!		
	Session 3 How can we use our knowledge of forces to solve problems?	**Session 3** We used our understanding of magnetism to define and solve a problem. We drew a model explaining how magnetic and other forces combined to solve a problem.	Magnets can be used to solve a variety of problems.	Invisible forces are everywhere. There are different types.	What other problems can I solve?