Unit 1 - Pushes, Pulls and Invisible Forces

Pacing Guide using Mystery Science

*Informational writing standards are now being covered in science. Please use these resources to address the informational writing standards. These lessons can be incorporated at any point during the unit.

Unit & Lesson #	Focus	Standards Addressed	Day (20-30 minutes)	Overview	Writing Activities	Additional Activities
Forces, Motion, & Magnets Anchor Phenomenon Ice Board	Forces & Engineering	3-PS2-1 3-PS2-4 3-5-ETS1-1 3-5-ETS1-2	1	The anchor phenomenon for this unit is a skateboard that has been modified to work on ice and be powered by the wind. During the introduction, students generate observations and questions about the phenomenon and create an initial conceptual model to explain how the ice board works. Students will gather clues during and after each lesson in this unit to help them improve their explanation. It is important to encourage students to recognize that even if they don't know the perfect answer yet, they are going to learn a	See-Think-Wonder Chart	

				lot throughout the unit and will have an opportunity to change or add to their first explanation.		
Forces, Motion, & Magnets Lesson 1 How could you win a tug-of-war against a bunch of adults?	Balanced & Unbalanced Forces	3-PS2-1	2	In this session, students will see that by learning to think about pushes and pulls — forces — they can accomplish extraordinary things!		
			3	In the hands-on activity, Hopper Popper, students make a folded piece of cardboard jump high in the air, propelled by the pulling force of a rubber band. They discuss the forces involved in making this “Hopper Popper” jump. Wrap-up slides & teacher-led discussion.		Online Book about Forces Give it a Push! Give it a Pull!
			4	Anchor Connection Students wonder: How can we design things that are strong enough to stand up to pushes	Science Journal Entry to answer anchor connection question.	

				and pulls? Students learn: The person riding the ice board applies pushes and pulls to the ice board to work against the wind and make the board move.		
			5	Lesson 1 Assessment Extensions include: Readings, activities, and videos.		
Forces, Motion, & Magnets Lesson 2 What makes bridges so strong?	Balanced Forces & Engineering	3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	6	In this session, students will learn about real-life bridge design.		
			7	In the hands-on activity, Paper Bridge Engineering, students will use their knowledge of forces to build a strong bridge that supports as many pennies as possible -- using only paper Wrap-up slides & teacher-led discussion.	Bridge Challenge Notebook	
			8	Anchor Connection	Science Journal Entry to answer	

				Students wonder: What happens when things slide past one another? Students learn: Certain materials on the ice board help the person riding it to push or pull in certain ways to make it move	anchor connection question.	
			9	Lesson 2 Assessment Extensions include: Readings, activities, and videos.		
Forces, Motion, & Magnets Lesson 3 How high can you swing on a flying trapeze?	Patterns of Motion, Gravity, & Friction	3-PS2-2	10-11	In this session, students investigate the patterns of motion exhibited by a trapeze. In the hands-on activity, Trapeze Tester, students build a model trapeze. They make observations and take measurements of the motion of that model and use that data to predict the motion of a real trapeze. Wrap-up slides &	Trapeze Training	

				teacher-led discussion		
			12	Anchor Connection Students wonder: Is there anything that pushes or pulls on something else without touching it? Students learn: For the ice board to work, it needs to have very high friction in some places, and very low friction in others.	Science Journal Entry to answer anchor connection question.	
			13	Lesson 3 Assessment Extensions include: Readings & activities		
Forces, Magnets, & Motion Lesson 4 What can magnets do?	Magnets & Forces	3-PS2-3	14	In this lesson, students will explore the surprising properties of magnets and experiment with an invisible force that acts at a distance. Wrap-up & teacher-led discussion.		
			15	In the activity,	Magnets are Weird	

				Magnet Discovery, students use ring magnets and common objects to discover the push and pull of magnets and how magnets attract certain types of metals.		
			16	Students wonder: How are magnets used to do useful things? Students learn: Compasses are able to work because they rely on long-distance magnetic forces.	Science Journal Entry to answer anchor connection question.	
			17	Lesson 4 Assessment Extensions include: Readings, activities, and videos		
Forces, Motion, & Magnets Lesson 5 How can you unlock a door using a magnet?	Magnets & Engineering	3-PS2-4 3-5-ETS1-1 3-5-ETS1-2	18	In this lesson, students investigate magnetic attraction and repulsion.		Online Books about Magnets (Magnets)
			19	In the activity, Invent a Magnetic Lock, students apply their scientific ideas about magnets to create a useful product: a		

				magnetic lock that can open a paper door. Students engage in the engineering design process to test and improve their designs. Wrap-up & teacher-led discussion.		
			20	Students learn: Designing a mount that will hold a compass in an easily visible spot will make navigation easier for the ice board rider.	Science Journal Entry to answer anchor connection question.	
			21	Lesson 5 Assessment Extensions include: Readings, activities, and videos		BrainPop Jr. Video (Magnets)
Forces, Motion, & Magnets CER			22	CER Activity		
Forces, Motion, & Magnets Unit Assessment			23	Forces, Motion, & Magnets Unit Assessment		
Forces, Motion, & Magnets Performance Task	Forces, Engineering	3-5-ETS1-1 3-5-ETS1-2	24	In this performance task, students will design new versions of the ice	Ice Board Designer	

Can you design a new ice board?				board that have to meet a specific set of design constraints. They will then build models of the ice board based on their designs.		
Benchmark #1			25	LPS Benchmark #1 (Given via LinkIt)		