

Unit 4 - Pushes and Pulls Pacing Guide

*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
Pushes & Pulls Anchor Phenomenon Big Barges	Pushes & Pulls	K-PS2-1 K-PS2-2	1	The anchor phenomena for this unit are barges! Students investigate how pushes and pulls affect the motion of barges, and how other machines allow us to use barges to move huge amounts of objects. During the introduction, students generate observations and questions about the phenomenon and create a list of possible explanations for the phenomenon. Students will gather clues during and after each lesson in this unit to help them improve their understanding and	See-Think-Wonder Chart	

				explanations. 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 lot throughout the unit and will have an opportunity to revisit the phenomenon over time.			
Pushes & Pulls Lesson 1	Pushes & Pulls	K-PS2-1	2	In this lesson, students discover that there are pushes and pulls involved in any kind of work, including the work done by machines. In the activity, Be a Digging Machine, students pretend to use shovels and excavators to dig a hole for a swimming pool. Wrap-up & Teacher-led discussion.	Huge Machines-Epic Book <u>Everyone Shouted Pull Read Aloud</u> (youtube)		
			3	Anchor Connection Students wonder: How else are barges loaded?	<u>Science journal</u> entry to answer anchor question.		

				Students learn: Digging machines use pushes and pulls to help lift and dump different kinds of cargo onto barges. Then, they can be moved to new places.			
			4	<u>Lesson 1</u> <u>Assessment</u> Extensions include: Readings, drawing, and videos.			
Pushes & Pulls Lesson 2 Why do builders need so many big machines?	Pushes, Pulls, & "Work Words"	K-PS2-1	5	In this Read-Along session, Vivian watches a house being built and wonders why the builders need so many big machines. The lesson includes a short exercise where students act out the "work words" of their favorite machine. You can extend the lesson with the optional activity, Forces at Work, where students watch videos of construction equipment and practice using work words to describe			Push and Pull with Big Machines- Epic Book

			what the machines are doing. Teacher-led discussion			
	6		Anchor Connection Students wonder: How else do barges move? Students learn: Dump trucks use pushes and pulls to help load and unload barges, just like digging machines do.		<u>Science journal</u> entry to answer anchor question.	
	7		<u>Lesson 2</u> <u>Assessment</u> Extensions include: Videos.			<u>Big Machines Video</u> (youtube)
	8		In this lesson, students explore the strength of pushes and pulls in order to solve a tricky problem.	K-PS2-1		<u>Pushes, Pulls, and Motion</u> <u>BrainPop Jr. Simple Machines</u> <u>Forces and Motion Unit</u>
Pushes & Pulls Lesson 3 How can you knock down a heavy wall?	9		In the activity, Don't Crush That House, students investigate how to adjust a model wrecking			<u>Demolition Read Aloud</u> (youtube)

			ball's force so they can knock down a wall of cups. The challenge: they can't knock down the paper houses right behind the cups! Wrap-up & Teacher-led discussion.			
			Anchor Connection Students wonder: Can tugboats hold a barge still? Students learn: Tugboats can either push or pull on barges to make them move. The tugboat goes behind the barge if it is pushing, and in front if it is pulling.	10		<u>Science journal</u> entry to answer anchor question.
			Lesson 3 Assessment Extensions include: Readings and videos.	11		
			In this Read-Along session, Daniel worries he won't do well at a friend's Bumper Bowling party...until he	12	K-PS2-2	<u>BrainPop Jr.</u> <u>Pushes and Pulls</u> <u>Forces and Motion</u> <u>Unit</u>
Pushes & Pulls Lesson 4 How can you knock down the most bowling pins?	Speeds & Direction of Force					

			figures out an unexpected way to win. The lesson includes a short exercise where students act out bowling. If you want to extend the lesson, you can try this optional activity, Human Bumper Bowling, where students make a model bumper bowling alley and work together to knock down pins. Teacher-led discussion.		<u>Motion Design Solution</u>
		13	Anchor Connection Students wonder: Why don't barges get damaged when tugboats push on them? Students learn: Tugboats can push barges up against other stationary objects. This keeps them from moving around when loading or unloading	<u>Science journal</u> entry to answer anchor question.	
		14	<u>Lesson 4</u>		

				<u>Assessment</u> Extensions include: Activities.			
Pushes & Pulls Lesson 5 How can we protect a mountain town from falling rocks?	Direction of Motion & Engineering	K-PS2-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3	15	In this lesson, students investigate how pushes can change the speed and direction of falling objects.		Pushing and Pulling- Epic Book Changing Direction- Epic Book <u>Forces and Motion</u> <u>Unit</u> <u>Ramps 2: Ramp</u> <u>Builder</u>	
			16	In the activity, Boulder Bounce, students play a game where they design a solution that protects a model town called Tiny Town from a bouncing-ball "boulder." Wrap-up & Teacher-led discussion.		<u>Push-Pull Changing</u> <u>Direction</u> <u>Marble Roll</u> <u>Roller Coaster</u>	
			17	Anchor Connection Students wonder: Are there different kinds of barges? Students learn: tugboats are covered in flexible	<u>Science journal</u> entry to answer anchor question.		

				materials, such as tires, that help to cushion impacts when pushing on barges.			
			18	<u>Lesson 5 Assessment</u> Extensions include: Readings and videos.			
Pushes & Pulls Lesson 6 How could you invent a trap?	Forces & Engineering	K-2-ETS-1-2	19	In this Read-Along session, twins Mimi and Lulu try different ways to catch a mysterious nighttime visitor...until they hit on just the right solution. The lesson includes a short exercise where students imagine how to design a good monster trap, and then pretend to be sneaky monsters. You can extend the lesson with the optional activity, Be an Inventor, where students draw their own inventions for machines that do chores. Teacher-led discussion.			<u>Create an Avalanche</u> <u>Box</u> <u>Make an invention</u>

			20	Anchor Connection Students wonder: How can we change which way a barge is moving? Students learn: There are many types of barges. Two of the most common types have either a large, flat top or a deep hold. They do different jobs.	Science journal entry to answer anchor question.	
			21	<u>Lesson 6 Assessment</u> Extensions include: Activities.		<u>Invent a back scratcher</u> <u>Forces and Motion Unit</u> <u>How to be an inventor! -Kid President (youtube)</u> <u>Be an engineer! (youtube)</u>
Pushes & Pulls Performance Task What do tugboats do?	Pushes & Pulls	K-PS2-2	22	In this performance task, students observe and predict how tugboats affect the motion of other ships. After a brief review of the unit, students gather observations		

					of tugboats in action, and then use those observations to predict how tugboats can change the speed or direction of other ships with pushes and pulls.				
Pushes & Pulls CER #1		K-2-ETS-1-1 K-2-ETS-1-2 K-2-ETS-1-3	23				<u>Pushes & Pulls</u> <u>CER #1</u>		
Unit 4 Common Assessment			24			<u>LPS Unit 4</u> <u>Common</u> <u>Assessment</u>			