

Forces and Interactions  
Pushes and Pulls

Lesson Description 1	Students will be expected to identify objects/things that can be moved and how they are put into motion.
<b>STAGE 1: DESIRED RESULTS</b>	
Enduring Understanding	Objects move in many ways when pushed or pulled.
Essential Question	How do objects move? How can you make an object move? How can you change an object's direction? What causes moving objects to stop?
Common Core Standards	CORE IDEA PS2: Motion and Stability: Forces and Interactions.
Content Objectives	Students can identify/brainstorm objects that can be moved Students can identify and problem solve how to move objects
Vocabulary	Movement, objects, direction, motion
<b>STAGE 2: ASSESSMENT PLANS</b>	
Informal Assessment Plans and Criteria	Assess through classroom discussions, exploration observations, and author's chair activity.
Formal Assessment Plans and Criteria	N/A
<b>STAGE 3: LEARNING EXPERIENCES</b>	
Time Required for Lesson Segments	Teacher Input: 5 minutes Guided Practice: 15 minutes Collaborative Practice: 5 minutes Independent Practice: N/A Closure: 5 minutes
Grouping Arrangements	Small Group: 10 students Cooperative Learning Groups: 2 groups

Materials and Technology	<p>Book: Motion, by Darlene R. Stille</p> <p>Materials to make eye charts</p> <p>Plain White paper</p> <p>Pencils</p> <p>Hokey Pokey song</p>
Description of Focus Student	Some students need to work independently to not get distracted with the other classmates.
Description of Adjustment or Modification	Have different pairs with children that are having difficulty understanding the concept. Having them work with teacher side and give them additional support.
Anticipated Set/Hook	Play a movement activity or sing a movement song, such as the Hokey Pokey.
Teacher Input (Demonstration/Lecture)	<p>Not only can we move our bodies, but have students brainstorm a list (pictures and words) of other objects we can move, either on them, at school, at home, or in their community (i.e. Legs, cars, ball, chair, door, desk, book, toy, clothes, etc.).</p> <p>Leave the brainstormed list up where students can view it and refer to it.</p>
Guided Student Practice	<p>Pose different questions such as, "Can objects move on their own?" (Can use example using a chair and needing to move it), and then, "I wonder the different ways we can make objects move?" (Write this question on chart paper/board).</p> <p>Tell them they are going to investigate this question using different objects around the room.</p> <p>Send them off to a designated area (classroom.) to investigate this question.</p> <p>Remind them they need to be safe and can work with others</p> <p>During this time observe and guide the students by asking questions that will further their learning (i.e. I see you are trying to pull that tub of crayons, what other motion can you use to make it move?).</p>

Collaborative Student Practice	The students will be working in group or pair looking around the room for objects that move.
Closure	<p>Gather students back up after a few minutes. Again, pose the question, "I wonder the different ways we can make objects move?"</p> <p>Have students share/explain some of the ways they could move objects, or how objects move.</p> <p>Write down key words they say such as walk, run, drop, lift, push, pull, drag, kick, bump, roll, slide, bounce, etc. on another chart labeled- How Objects Are Moved.</p> <p>Read the book (if time) Motion, by Darlene R. Stille</p> <p>Bring students back together to review the concepts learned today (Charts- what objects can be moved, how we move objects).</p> <p>Tell students to keep their eyes open for moving objects and objects being moved throughout the rest of the day.</p>

Lesson 2  
Pushes and Pulls

Lesson Description	Introduction of push and pull and discovering these in our world.
STAGE 1: DESIRED RESULTS	
Enduring Understanding	<ul style="list-style-type: none"> <li>• Pushing or pulling on an object can change the speed or direction</li> <li>• Pushes and pulls can have different strengths and directions</li> <li>• When objects touch, or collide, they push on one another and can change the motion</li> <li>• A bigger push or pull makes things speed up or slow down more quickly</li> </ul>
Essential Question	<p>Why does push or pull affect the motion of an object?  How does speed affect the motion of an object?  How can changes in force or speed be related?</p>
Common Core Standards	<p>K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.</p> <p>K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.</p>
Content Objectives	<p>Students will know the difference between a push and a pull.</p> <p>Students will know that pushes and pulls can have different strengths and directions.</p>
Vocabulary	Pull, Push, Roll, Motion, Data, speed, direction, force
STAGE 2: ASSESSMENT PLANS	
Informal Assessment Plans and Criteria	Through activity observations and questioning

Formal Assessment Plans and Criteria	Not during this lesson
STAGE 3: LEARNING EXPERIENCES	
Time Required for Lesson Segments	Teacher Input: 5 minutes Guided Practice: 15 minutes Collaborative Practice: 5 minutes Independent Practice: N/A Closure: 5 minutes
Grouping Arrangements	Small Group: 10 students Cooperative Learning Groups: 2 groups
Materials and Technology	Chart paper (to make a T-chart) Book: Give it a Push! Give it a Pull! By Jennifer Boothroyd
Description of Focus Student	Some students verbally express the vocabulary instead of writing it down, they can express by doing instead of writing it down. Some students need to work independently to not get distracted with the other classmates.
Description of Adjustment or Modification	Have different pairs with children that are having difficulty understanding the concept. Having them work with teacher side and give them additional support.
Anticipated Set/Hook	Play a movement activity or sing a movement song, such as the Hokey Pokey.
Teacher Input (Demonstration/Lecture)	Review movement chart from lesson #1 Identify opposite actions (walk/run, open/close or shut, push/pull); identify the opposite pair that starts with the same sound
Guided Student Practice	Create a class definition of push Create a class definition of pull Read the book: Give it a Push! Give it a Pull! By Jennifer Boothroyd Compare our definitions with the definitions in the book
Collaborative Student Practice	Find things in the classroom that push or pull or need to be pushed and pulled Come back together & create a push/pull T-chart.

Closure

Close our lesson by having each student explain how they pushed or pulled something in the classroom and what that action created (cause & effect).

Lesson Plan 3  
Pushes and Pulls

Lesson Description	Students will spend time planning and investigating the motion of objects using a ramp over about 2 days. They will explore push and pull. They will be introduced to different objects (balls, cars, string, etc.) to explore on the ramp.
STAGE 1: DESIRED RESULTS	
Enduring Understanding	<p>Pushing or pulling on an object can change the speed or direction</p> <ul style="list-style-type: none"> <li>• Pushes and pulls can have different strengths and directions</li> <li>• When objects touch, or collide, they push on one another and can change the motion</li> <li>• A bigger push or pull makes things speed up or slow down more quickly</li> </ul>
Essential Question	<p>How does speed affect the motion of an object? How can changes in force or speed be related?</p>
Common Core Standards	<p>K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.</p> <p>K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*</p>
Content Objectives	<ul style="list-style-type: none"> <li>• Students can plan an investigation on how objects move</li> <li>• Students can explore motion and direction by using a ramp</li> <li>• Students can explain the difference between a push and a pull</li> <li>• Students can share/discuss my observations</li> <li>• Students can describe and understand how objects move</li> </ul>
Vocabulary	Investigate, push, pull, ramps, speed, motion change of direction.
STAGE 2: ASSESSMENT PLANS	
Informal Assessment Plans and Criteria	Observation, Discussion, Participation, and Questioning during investigation with ramps.

Formal Assessment Plans and Criteria	Their journals to see if they understand the terms and difference.
STAGE 3: LEARNING EXPERIENCES	
Time Required for Lesson Segments	Teacher Input: 5 minutes Guided Practice: 15 minutes Collaborative Practice: 5 minutes Independent Practice: N/A Closure: 5 minutes
Grouping Arrangements	Small Group: 10 students Cooperative Learning Groups: 2 groups
Materials and Technology	Rope (jump rope) · Round objects (golf balls, ping pong balls, cotton balls, Styrofoam balls, marbles, wooden spheres) · Cylinder objects (wooden cylinders, toilet paper rolls, soup cans, water bottles, pop cans) · Toy cars · Ramps · Objects to add weight · String/Yarn · Books or objects to use to change ramp · Stopwatches · Rulers · Introduce I wonder...sheets in Student Journals · Scientific Method sheet in Student Journals · Pencils
Description of Focus Student	Some students need to work independently to not get distracted with the other classmates and for the lesson be easier for them to understand.
Description of Adjustment or Modification	Have different pairs with children that are having difficulty understanding the concept. Having them work with teacher side and give them additional support creating the ramps for them to explore.
Anticipated Set/Hook	Review examples from T-Chart of things that need a push (balls, swings, toy cars, push door closed, push down lids, etc.) to start moving and objects that require a pull (wagon, tug-of-war, shade pulls, rope on the flag, pull up socks/pants/zipper, pull doors, etc.)
Teacher Input (Demonstration/Lecture)	Demonstrate pushes and pulls with the class by playing a quick game of tug-of-war (you can use a big rope and include everyone all at once or use a smaller rope (jump rope) and have a few students participating at a time).



	<p>Use different scenarios using more students on one side, have one side push and one side pull, both pulling, both pushing, etc. (you can pose these as questions, “What would happen if...” and “What happened when...”)</p> <p>Have the students explain the difference between pushes and pulls</p>
<p>Guided Student Practice</p>	<p>Students will explore the path of moving objects and describe motion by working in groups with balls, toy cars, cylinders (toilet paper rolls, cans, water bottles), ramps, string, and weights and measuring tools- rulers, tape measurers, stopwatches, timers (have this extension material available, but not assessed).</p> <p>Give students sufficient time to conduct simple investigations into the motion of objects down the ramps. *At this stage in their learning, students ask and answer “What would happen if...” questions as they change their angle of their ramps and find other objects to roll down the ramp.</p> <p>You can prop the ramps up on chairs, desks, walls, books, or any stationary objects.</p> <p>Facilitate the student activity by circulating among the groups and listening to their ideas and observing their simple investigations. To make it more challenging add a different shaped item to the students’ objects, such as a block or cube, and ask students to describe the motion of the block down the ramp.</p>
<p>Collaborative</p>	<p>The students will be working in groups to use different ramps and see their results so they can share with the class at the end of the lesson.</p>
<p>Closure</p>	<p>Have the children share with the group of what they found about the objects as going down the ramp. And share their findings about push and pull objects.</p>