



Push and Pull

Grade: Kindergarten

Category: Physical Science

NGSS: K-Forces and Interactions: Push and Pull (K-PS2-1, K-PS2-2)

Description: In this lesson, the students will learn that pushing or pulling an object can move the object. Pushing an object move the object away from us while pulling an object, bring the object closer to us. They will also learn that pushing and pulling can change the speed of an object and can start or stop it. A bigger push or pull makes things speed up or slow down.

Learning objectives:

- Understand that an object moves when we push it or pull it.
- Understand why some objects are easy to move while some objects are difficult to move.
- Understand that push action moves things away from us while a pull action brings things closer to us.
- Understand that to move heavy objects, we have to use more force.

Key words: push, pull, force, energy, speed, faster, slower, toward, away from



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Engage (E1)

Purpose: To assess students' prior knowledge of how an object can be moved.

Background information for teachers:

Every day, we push and we pull. Push and pull can move things. Sometimes we push things, moving objects further away from us. Other times, we pull, bringing objects closer to us. Pushing and pulling are both examples of force. When we push or pull something, we are applying force to it so it will move.



Classroom Q&A

Ask two students to stand up in front of class. Draw a line between them and give them a rope to play tug of war. Explain that they need to pull the rope until the other student crosses the line. The person who crosses the line first, loses the game. Ask these questions:

- What are the students doing? *They are pulling the rope.*
- What must they do to win the game? *The team that pulls harder will win.*
- Now ask two more students to join one side. Which team will win? Why? *The team with more people will win because they use more force.*



Digital Activity

Login to Koantum and find the "Push and Pull" lesson. Open the following page and have the students describe what each kid is doing. Ask these questions:



- This girl is flying a kite. To keep the kite in the air, should she push the string or pull the string? *She needs to pull the string to keep the kite in the air.*
- This boy is kicking a ball. Is kicking a push action or a pull action? *When you kick a ball you are pushing it with your leg so it moves away from you. If he kicks the ball harder, it will move faster and it will move further away.*
- This boy has stepped outside, but before he can play, he must shut the door. Do you think he should push the door or pull the door to close it? *He pulls the door shut.*
- This boy is done playing. He wants to go inside. How will he open the door? Should he push the door or pull the door? *He must push the door to open it.*
- This girl is trying to move a heavy basket. Does she appear to be pushing or pulling the basket? *She is pulling the heavy basket.*

Explore (E2)

Purpose: To explore more about push and pull.

Background information for teachers:

In this lesson, the students only learn about the forces that are in direct contact with objects. There are forces that are not in direct contact with objects, such as magnetic and gravitational forces.

Gravity is a force that pulls us toward the ground. This is why when we throw something in the air; it will come back down again. Without gravity, everyone and everything would be floating around.



Video

Gravity | Dr. Binocs Show, Learn Series For Kids

<https://youtu.be/suQDwZcnJdg>



Printable Activity

Have students complete the printable activity "Push or Pull? 1" by drawing a line from each picture to the correct action.

Answer key:

- They are all PUSH actions.



Printable Activity

Have students complete the printable activity "Push or Pull? 2" by drawing a line from each picture to the correct action.

Answer key:

- They are all PULL actions.



Printable Activity

Have students complete the printable activity "Push Actions" by circling the push actions.



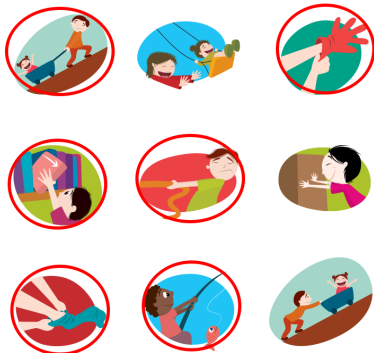
Answer key:

- Pushing a button
- Push the swing
- Throw a ball is a push action
- Push a heavy box
- Writing is a push action



Printable Activity

Have students complete the printable activity "Pull Actions" by circling the pull actions.



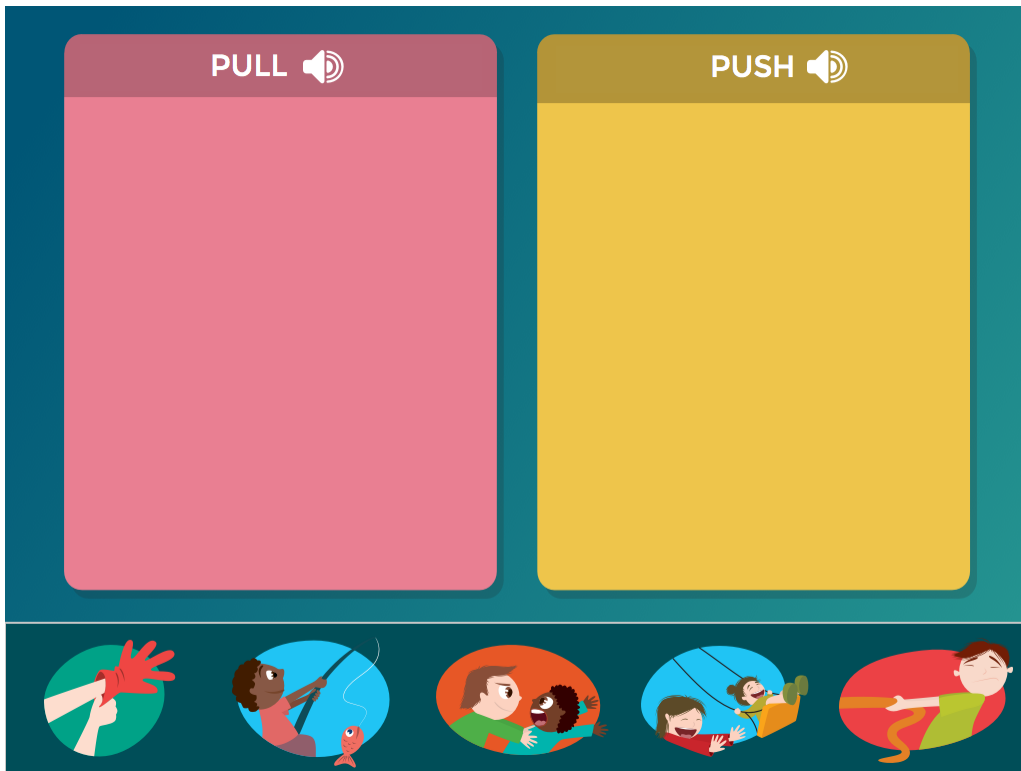
Answer key:

- Dad pulling the wagon uphill.
- Pulling the glove
- Pulling a book from bookcase
- Pulling a rope
- Pulling sock
- Pulling a fish out of water



Digital Activity

Login to Koantum and find the "Push and Pull" lesson. Open the following page and have the students complete the activity.



Answers:

- Dad pulling the wagon uphill.
- Pulling the glove
- Pulling a book from bookcase
- Pulling a rope
- Pulling sock
- Pulling a fish out of water
- Bird pulling a stick
- Pushing a button
- Pushing the swing
- Throw a ball is a push action
- Pushing a heavy box
- Writing is a push action
- Kid pushing another kid
- Dad pushing a wagon uphill



Printable Activity

Have students complete the printable activity "Push vs. Pull" by circling the picture that does not match the action.



Answer key:

Row1: Dad pulling the wagon uphill is not a push action.

Row2: Squeezing a ball is a push action not a pull action.

Row3: Pulling a wagon is not a Push action.

Row4: Pressing a button is a push action.



Classroom Activity

Make a Paper Spring

Materials needed:

- Strips of colored paper of equal size (such as 8.5" x 1"), at least 2 per student
- Glue

Have the students form a right angle with the two strips of paper so that the ends overlap; glue the strips together. Fold the lower strip over the one on top, and repeat this step until both strips form a square (both strips should be zigzagged across each other). Glue the top flap.

Explain to students that springs are something that both push and pull. Have them try to compress their paper spring to see it push back. What do you think will happen when you let go if you pull the spring from both sides? Is it more fun to push the spring down or pull the spring and stretch it?

Explain (E3)



Digital Activity

Login to Koantum and find the "Push and Pull" lesson. Open the following page and go over the slides to make sure they understand the subject.



1. We push and pull things each and every day. For example, we pull the door to close it but we push the door to open it. In both examples we are using force because we are

changing the location of the door.

2. A push action moves things away from us while a pull action brings things closer to us.
3. Force is a fancy word for pushing and pulling. When we push or pull something, we are applying force to it. We use force to move objects and to make them stop, slow down, and go faster. We also use force to change the shape of an object—like when we squeeze a squishy ball or play with clay.
4. To move heavy objects, we have to use more force. Which one of these two kids should use more force to move the box? That's right! The boy needs to use more force because it is heavier. Light things are easy to move. Heavy things are difficult to move.

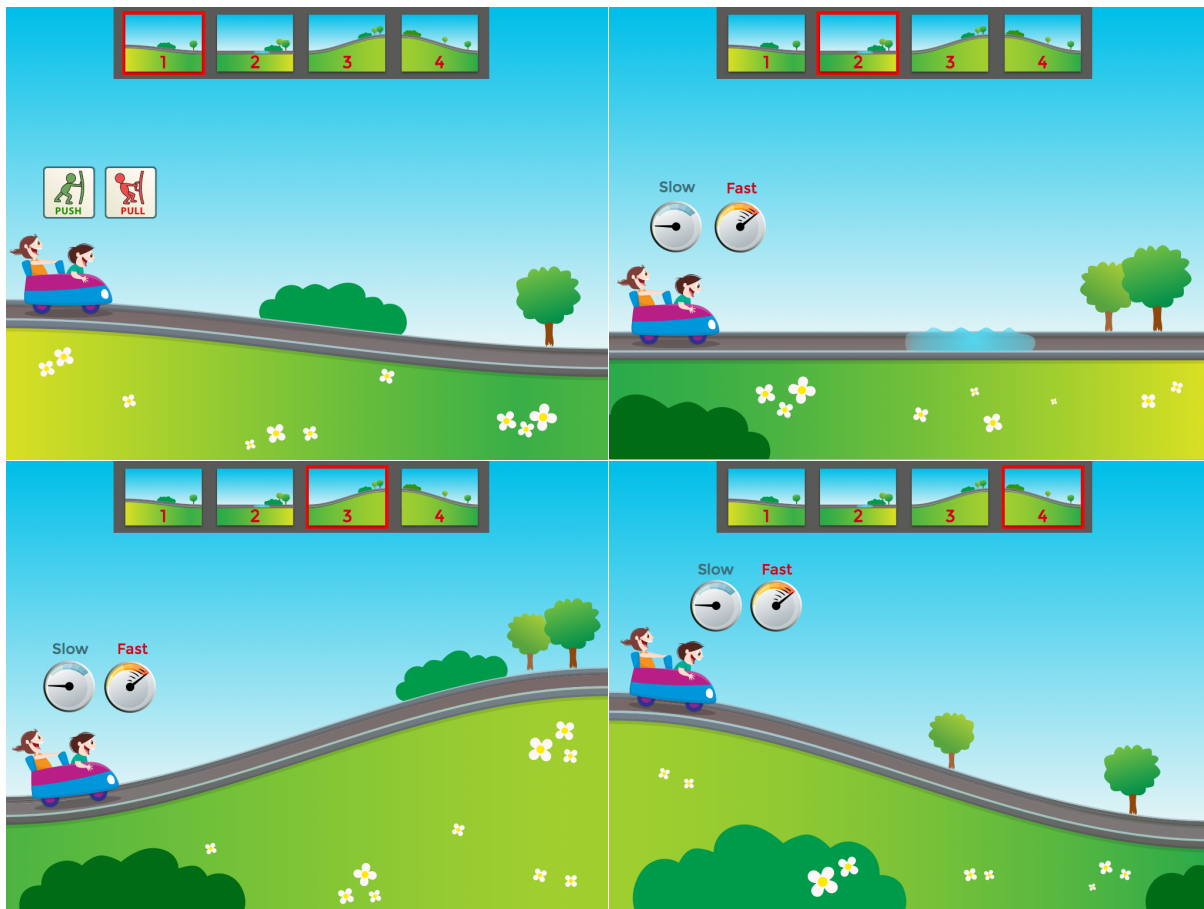
Elaborate (E4)

Purpose: To apply push and pull to move things.



Digital Activity

Login to Koantum and find the "Push and Pull" lesson. Open the following page and select the buttons at the top to switch between the screens and ask these questions.



1. Those children are on a ride. In order to move the cart, do we need to push the cart or pull the cart? *This cart needs a push.*
2. What will happen to the cart when it passes through the water? Does it get faster or slow down? *The water slows the ride down.*
3. What will happen to the cart when it goes uphill? Does it get faster or slow down? *It slows down.*
4. What will happen to the cart when it goes downhill? Does it get faster or slow down? *It gets faster.*



Classroom Activity

Pushing and Pulling

Materials needed:

- Scooter boards (alternatives: cardboard boxes, plastic recycling bins)
- Open space (gym)

Have the students choose a partner; have one student push the other on the scooter board from one side of the room to the other. Then, have the same student pull their partner back. Have them switch places and repeat.

Have both students sit on the scooter boards, facing each other; have them put their hands against each other. Have them try pushing away from each other gently to see how far they get from each other. Then, try again, having them push against each other as hard as they can. Explain that friction works against movement, which is why some things are more difficult to push and pull.

Ask if rolling the scooter on carpet would be easier than the gym floor (no, carpet would cause more friction and make it harder to push or pull.) Alternatively, if you are using cardboard boxes or plastic bins, ask if having wheels would make it easier or more difficult to push or pull (it would be easier, because there is less friction). If there were more friction, do you think that pushing away from each other would be easier or more difficult?



Video

Swings, Slides, and Science | SciShow Kids

<https://youtu.be/JvSCIZ3vHOI>



Fun Facts

- There are some forces that push and pull without touching, such as magnetism—when two magnets are attracted to or push away from each other.
- Gravity is different on every planet. Did you know that gravity on the moon is only 1/6th of Earth's gravity? That means you can jump 6 times higher!

Evaluate (E5)

Purpose: To assess students' understanding of the lesson.

- 1- Kicking a ball is an example of a _____.
 - a) pull
 - b) **push**
 - c) stretch
 - d) speed

- 2- Picking up a ball is an example of a _____.
 - a) push
 - b) stretch
 - c) collision
 - d) **pull**

- 3- A ball is pushed to the top of a hill. When it rolls down, it will _____.
 - a) **go faster**
 - b) go slower
 - c) stop
 - d) stay at the same speed

- 4- When I _____, I move it away from me.
 - a) **kick a ball**
 - b) pull the string of a kite
 - c) pull a weed
 - d) pull out a chair

- 5- When I _____, I move it closer to me.
 - a) push a box
 - b) push a bicycle
 - c) push a button
 - d) **pull a toy wagon**

- 6- A push or pull CANNOT change an object's _____.
 - a) **weight**
 - b) direction
 - c) shape
 - d) speed

- 7- Squeezing a rubber ball between the palms of your hands is an example of _____.
 - a) stretch

- b) pull
- c) speed
- d) push

8- A force is any action that changes the _____ of an object.

- a) weight
- b) speed
- c) shape
- d) location, speed, or shape

9- When an object is too heavy, you need to use more _____ to move it.

- a) weight
- b) speed
- c) force
- d) tools

10- Gravity is a natural force because it makes objects _____ each other.

- a) pull toward
- b) push away from
- c) spin toward
- d) spin away from