



LESSON PLAN

PUSHES AND PULLS GRADES K-2

SUMMARY

Students will see Dr. Jeff, Elijah, and Olivia show off some engaging demonstrations involving forces. They will then be able to get hands-on with forces to experiment with pushes and pulls. Duration: Two 30-minute classroom periods.



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.

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.

Science & Engineering Practices	Connections to Classroom Activity
Planning and Carrying Out Investigations	<ul style="list-style-type: none"> • Students conduct experiments using Cheerios
Disciplinary Core Ideas	Connections to Classroom Activity
<p>S2.A: Forces and Motion</p> <p>Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.</p>	<ul style="list-style-type: none"> • Students push objects towards themselves or towards a partner • Students change the speed and direction of the objects
Crosscutting Concepts	
<p>Cause and Effect</p> <p>Simple tests can be designed to gather evidence to support or refute student ideas about causes.</p>	<ul style="list-style-type: none"> • Students decide which method can best cause an object to be moved.



ENGAGE

Take students outside to the playground (grassy area, if possible). Have two student volunteers come in front of the class and face each other about two feet apart. Hand one volunteer a rubber ball.

Ask: *How can you move this ball towards your partner without moving over to your partner?*

One partner will probably throw the ball towards the other and the other will catch it.

Ask: *How can your partner move the ball back towards you?*

One partner will probably throw the ball back towards the first partner.

Say: You **push** the ball towards your partner when you throw it. When the other partner catches it, they usually **pull** it back towards their own body.

Ask: *What equipment do you use at recess?*

Have them find a piece of equipment where a volunteer can demonstrate a push or a pull.

Ask: *How can you move _____ towards you? How can you move _____ away from you?*

If you have bars on the playground, have a student demonstrate a pull-up. If you have a wagon, have one student sit in a wagon and another pull or push the wagon. You can also use a rubber ball from the playground equipment for additional practice throwing and catching. Have them distinguish between a push and a pull in each activity.

MATERIALS

- 5-10 Cheerios
- 1 straw
- 1 piece of string or thin yard (=1 ft.)
- 1 Zip-loc bag

DIY Activity

- 20-30 books
- 2 plastic cups
- Scissors
- Roll of masking tape
- Yardstick
- Golf ball



EXPLORE

Place students in teams of two. Give each team a pre-filled Ziploc bag containing their materials. Explain that they will be doing experiments using the Cheerios as objects to be moved. The straw and the string will be the “tools” you may use during your experiment.

Steps

1. **Say:** *Move a Cheerio towards yourself.* (Observe as they use their hand or the straw to move the Cheerio.)
2. **Ask:** *How did you move the Cheerio? Was this a push or a pull?* Discuss the ways (forces) used.
3. **Say:** *Move a Cheerio towards your partner.* (Observe as they use their hand or the straw to move the Cheerio. Some may use the straw to blow the Cheerio towards their partner.)
4. **Ask:** *How did you move the Cheerio? Was this a push or a pull?* Discuss.
5. **Ask:** *Can you move a Cheerio more quickly towards yourself?* (Observe as they use their hand or the straw to move the Cheerio. Some may use the straw to blow the Cheerio towards their partner. Look to see if any students tie the string to the Cheerio and pull it towards themselves.)



6. Ask: How were you able to make the Cheerio move more quickly? Was this a push or a pull? Discuss the different methods/forces utilized.

7. Ask: Can you move a Cheerio more quickly towards your partner? (Observe as they use their hand or the straw to move the Cheerio. Some may use the straw to blow the Cheerio towards their partner.)

8. Ask: How were you able to make the Cheerio move more quickly? Was this a push or a pull? How did you change the direction of the Cheerio? Discuss the different answers with the students.



EXPLAIN

Tell the students that when they bring the Cheerio towards themselves, they are using a pull. When they move it towards their partner, they are using a push. Both of these are forces that make things move. There are many more examples they will see in the video.



AS A CLASS, WATCH THE GENERATION GENIUS PUSHES & PULLS VIDEO

Facilitate discussion using the Discussion Questions



ELABORATE

Bring students to your usual instructional area (rug, etc.). Have each student sit knee-to-knee and take turns telling their partner three things (objects) that they can pull closer to them and three things they can push away from them. Then make a class list on the board or a large chart.



EVALUATE

Complete the *Genius Challenge* worksheet or the online quiz game located below the video. Alternatively, you can construct a chart with two columns, one labeled PUSH, and one labeled PULL. Have your students draw a picture of a push or a pull on a sticky note and tape it to the appropriate column. (Older students may just write the name of an object on the sticky note.) Evaluate with the students the placement of each item in the appropriate column.



EXTENSION

Suggestions for science stories to read (all available on Amazon):
[Give it a Push! Give it a Pull! \(A Look at Forces\)](#) by Jennifer Boothroyd
[Push and Pull: \(The Way Things Move\)](#) by Lola M. Schaefer
[Push and Pull](#) by Patricia Murphy
[Push and Pull \(Investigate!\)](#) by Charlotte Guillain

