Pushes and Pulls Move Cars

Teacher		**Class**	Kindergarten
Subject	Science	**Topic**	Pushes and pulls
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn pushes and pulls move things. They test gentle, strong, and sideways pushes with toy cars.

Curriculum links

- pushes and pulls affect the motion of objects [1]
- Pushes and pulls can affect the movement of an object [1]

Learning objectives

- Students will show push direction changes which way a toy car moves.
- Students will compare gentle and strong pushes to see how far cars go.

Success criteria

- I can push gently and strongly and tell which went farther.
- I can push a car and show it goes the way I push.

What students already know

Show me with your arms: push away, pull toward you. What did you push or pull today to move it?

Key words

push	to move something away from you [7]
pull	to bring something close to you [7]
move	to go, stop, or turn [9]
strong	with a lot of power, hard and far [4]
direction	the way something goes [9]

Materials

- toy cars
- painter's tape
- large paper arrows
- Slides 1-12
- Video clip 1 (0:00–1:11) and Video clip 4 (0:00–4:50)
- Worksheet page 1 printed for each student, crayons

Before the lesson

- Print Worksheet page 1 for each student and crayons
- Test Slide 6 Video clip 1 (0:00–1:11) and Slide 8 Video clip 4 (0:00–4:50) with sound
- Tape a large cross on the floor with painter's tape and set out toy cars and large paper arrows
- Make a start line with tape for pairs to use

Lesson outline

0–8 min **Starter** 8 min · Whole class

Hook students and recall push and pull with the car direction game.

YOU DO

1. Show Slide 1 Push and Pull! Let's Move Things! and Slide 2 Big idea Pushes and pulls move things.
2. Hold up a toy car and say the hook: This car only listens to my hands. If I push it this way, where will it go? Push forward, then push left and let students call out.
3. Show Slide 3 Key words push, pull, move and lead actions: push hands away, pull hands close.
4. Show Slide 5 Pick One Which to test first? Ball, Toy car, Box and take a vote to choose toy car.

STUDENTS DO

1. Watch the car demo and point where it will go.
2. Show push hands away and pull hands close and say push or pull.
3. Vote for Ball, Toy car, or Box and count with the class.

Say: This car only listens to my hands. If I push it this way, where will it go? What if I push it that way? Pushes and pulls move things. Let's test toy cars today.

Worked example: I put the car in the middle. I push it forward. It goes forward. I push the same car to the left. Now it goes left. The car goes the way I push.

Ask: If I push the car this way, which way will it go? (It will go that same way, forward.) · Is pushing the car away a push or a pull? (A push, move away from you.)

Check understanding: All students point the way the car will go before each push; if many point wrong, push again slowly and narrate.

Support: Let the student stand close and copy the teacher's hands for push away and pull close. **Stretch:** Let the student tell what would happen if you pull the car back toward you.

Use: Slides 1-3, 5

8–20 min **Teaching** 12 min · Whole class

Teach that gentle pushes go a little, strong pushes go far, and sideways pushes turn.

YOU DO

1. Show Slide 4 Did you know? You cannot see a push! You only see what starts, stops, or turns. Explain pushes and pulls can affect the movement of an object [1].
2. Play Slide 6 Sing and Move Video clip 1 pushes and pulls song (0:00–1:11) and lead Show push hands! Show pull hands!
3. Show Slide 7 Hard and Soft: Gentle push goes a little, Strong push goes far, Sideways push turns it.
4. Demo with the same toy car from the same start line: one gentle push, one strong push, then a sideways push, marking each stop with tape.

STUDENTS DO

1. Sing and show push hands and pull hands with the song.
2. Watch the three pushes and say which went a little, far, or turned.
3. Chant gentle goes a little, strong goes far with hand motions.

Say: You cannot see a push. You only see what starts, stops, or turns. A gentle push goes a little. A strong push goes far. A sideways push turns it.

Worked example: I start at the line. I give a soft push. Mark stop. It stops close. I start again at the same line. I give a hard push. Mark stop. It goes far past the first mark. The direction an object moves depends on the direction of the push [6].

Ask: Which push will make the car go farther, gentle or strong? (Strong push goes far.) · What happens if we push the car from the side? (It turns and goes sideways.)

Check understanding: Students hold up large paper arrows to show little push, big push, or turn; reteach with another slow demo if mixed.

Support: Seat the student near the start line so the two stop marks are easy to see and compare. **Stretch:** Have the student predict if the next push will stop short of, on, or past the first mark, then test.

Use: Slides 4, 6-7, Video clip 1 (0:00–1:11)

20–30 min **Watch Together** 10 min · Whole class

Practice spotting pushes and predicting direction together before pairs test.

YOU DO

1. Show Slide 8 Watch Cars: Clap for a push, Stomp for a pull and play Video clip 4 kindergarten push and pull (0:00–4:50).
2. Pause twice to ask push or pull and gentle or strong, noting pushes and pulls can make objects move, stop, speed up, slow down, change direction or change shape [9].
3. Place a car on the taped cross, hold up a large paper arrow, and model pushes from front, back, left, and right.

STUDENTS DO

1. Clap for push, stomp for pull during the video.
2. Hold up paper arrows to predict the push way, then watch the car go that way.

Say: Clap for a push. Stomp for a pull. Watch which way the car goes. The car goes the way we push it. Changing from gentle pushes and pulls to hard pushes and pulls changes movement [4].

Worked example: I hold the front arrow. I push from behind. The car goes forward. I hold the side arrow. I push from the side. The car turns left. Same car, new push way, new go way.

Ask: I plan to push from the right. Which way will the car go? (To the left, the same way as the push.) · Was that stopping the car a push or a pull? (A push, a push or pull can also stop a moving object [7].)

Check understanding: Quick arrow vote before each push; if predictions are split, repeat the push slowly and narrate the way.

Support: Let the student keep a hand lightly near the car while the teacher pushes slowly to feel the start.
Stretch: Have the student call out the next push way for the class to test.

Use: Slide 8, Video clip 4 (0:00–4:50)

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30–50 min **Main activity** 20 min · Pairs

Pairs plan and conduct a fair test of soft, hard, and sideways pushes.

YOU DO

1. Show Slide 9 Your task: Give a soft push. Mark stop. Give a hard push. Mark stop. Push from the side. Which way does it turn? Push toy cars. See how far they go.
2. Give each pair a car, tape, and arrows. Show same car, same start line, push soft then hard, mark each stop.
3. Send pairs to spots to plan, test, and mark: soft push, hard push from same spot, then side push with arrow.
4. Circulate, ask which went farther and which way it turned, reminding them we can see the effects a force has on objects [6].

STUDENTS DO

1. Take turns: one pushes, one marks the stop with tape and holds the arrow.
2. Compare marks and tell which push went farther and which side push turned it.
3. Stand by marks to show results when the teacher calls time.

Say: In pairs, start at the same line. Give a soft push. Mark stop. Give a hard push. Mark stop. Now hold up your arrow, push from the side. Which way does it turn? Tell your partner which went farther.

Worked example: Student A puts the car at the line and holds the forward arrow. Soft push, mark with tape. Same line, hard push, mark with tape. Hard mark is past soft mark. Then Student A holds the side arrow, pushes from the side, car turns. Partners switch jobs and try again.

Ask: Which push sent the car farther, and how do you know? (Hard push, its tape mark is past the soft mark.) · What made the car turn? (Pushing from the side, direction of push changes direction.)

Check understanding: Pairs stand by their two marks and point to farther mark and show turn arrow; retest together if marks are missing or start moved.

Support: Let the student first keep a hand lightly on the car while pushing slowly to feel the direction, since we can see the effects a force has on objects [6]. **Stretch:** Have the student give the rolling car a second small push from the side to change its path while it is still moving.

Use: Slide 9

50–60 min **Plenary** 10 min · Whole class

Name pushes and pulls and check gentle, strong, and direction ideas.

YOU DO

1. Show Slide 10 Push or Pull? cards: Push Kick a ball away, Pull Tug a rope close to you, Push Push a toy car far, Pull Pull a wagon along. Act each with arms and sort under Push and Pull.
2. Hand out Worksheet page 1: Circle the right word: Circle push or pull for each picture! Students circle with crayons.
3. Finish with Slide 11 mystery Big push goes far. Little push stops short. What am I? Toy car! and Slide 12 True or false? for Big push goes far and Side push can turn.

STUDENTS DO

1. Act out kick, tug, push car, pull wagon and say push or pull in a full sentence.
2. Circle push or pull on Worksheet page 1.
3. Answer true or false with thumbs up or down.

Say: When you kick a ball you are using a push and when you tug on a rope, you are using a pull [7]. Show me push away and pull close. Now circle push or pull for each picture. Big push goes far is true.

Ask: Is kicking a ball away a push or a pull? (Push.) · True or false: side push can turn things? (True, sideways push turns it.) · True or false: big push goes far? (True, strong push moves more.)

Check understanding: Check Worksheet page 1 circles and thumbs for Slide 12; if many miss pull, act tug a rope close again.

Support: Let the student hold a real rope and ball and try the motion while deciding push or pull. **Stretch:** Have the student find an action that uses both a push and a pull.

Use: Slides 10-12, Worksheet page 1

Common mistakes

Mistake	How to spot it	How to fix it
Thinking you can see the push itself	Student points to air instead of the car moving	Repeat you cannot see a push, you only see what starts, stops, or turns, and narrate the car starting and stopping [6].
Thinking gentle and strong pushes go the same far	Student says both marks will be the same	Retest from the same start line and compare marks, a strong push goes far and gentle goes a little [4].
Mixing push away and pull close	Student calls tugging a rope a push	Act it out: kick a ball away is push, tug a rope close is pull, pull brings things close [7].

Support

- Tape a clear start line and let the student push from hands-and-knees close to the floor
- Let the student first keep a hand lightly on the car while pushing slowly to feel the direction, since we can see the effects a force has on objects [6].

Stretch

- Have the student predict before each push if it will stop short of, on, or past the first mark, then test
- Have the student give the rolling car a second small push from the side to change its path while it is still moving.

For the LSE or teaching assistant

Stay with pairs during main test: hold start line, help mark stops, model arrow language for direction.

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Check for understanding

Question	Answer
Which push goes farther, soft or hard?	Hard push goes farther.
If you push a car to the left, which way does it go?	To the left.
Is pulling a wagon toward you a push or a pull?	Pull.

Sources

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