PUSH, PULL, AND THE MOTION OF OBJECTS

BIG IDEA 13: FORCES AND CHANGES IN MOTION

BENCHMARKS AND TASK ANALYSES

SC.K.P.13.1 Observe that a push or pull can change the way an object is moving.
The student:

- identifies a push.
- identifies a pull.
- uses pushes and pulls to move various objects.

SC.K.N.1.3 Keep records as appropriate---such as pictorial records---of investigations conducted.
The student:

- records information about classroom investigations using pictures, science notebooks, or class data tables.

SC.K.N.1.1 Collaborate with a partner to collect information.
The student:

- works with a partner to gather information during classroom investigations.

KEY QUESTIONS

What is a push?
What is a pull?
What force (push or pull) is used to make objects move in a certain direction?

TEACHER BACKGROUND INFORMATION

A force must act upon an object in order for motion to occur. When more force is applied, more movement will be observed. When less force is applied to the same object, less movement will be observed. Pushes and pulls are forces that make movement occur. Push means that the object is moving away from the person pushing and pull means the object is moving towards the person pulling.

MATERIALS

Teacher

ball
chair
The Enormous Turnip by Kathy Parkinson

Per group

various objects (blocks, toy cars, Unifix cubes, etc.)
chairs

SAFETY

- Always follow OCPS science safety guidelines.
- Remind students to not place objects in their mouths.
- Choose objects that do not have sharp edges.
- Remind students not to throw objects.

TEACHING TIPS

This lesson may take more than one day. Continue requiring students to use the terms ‘push’ and ‘pull’ to describe the force they use to make objects move.

ENGAGE

Push a chair in and ask students what was done to make the chair move. Pull a chair out and ask students what was done to make the chair move. If students do not supply the words 'push' and 'pull,' introduce the terms. Direct students to push in their chairs and pull out their chairs. Ask various students to describe what made the chair move. Read *The Enormous Turnip*. Discuss.

EXPLORE

Direct students to sit in a circle on the floor. Have a child push a ball (roll) towards someone else in the class describing how they made the ball move away from them (push). Have the child that receives the ball describe how they made the ball move to get closer to them (pull). Repeat until all students have had a turn.

Allow students to push and pull various items (blocks, toy cars, Unifix cubes, etc.) Circulate the room and ask students to demonstrate push and pull requiring that the students use the words to describe how they made their item move.

EXPLAIN

Open a door and have students identify the motion as a push (moves away from the person pushing) or a pull (moves towards the person pulling). Repeat with drawer, cabinet, etc. Focus on allowing students to identify the type of force (push or pull) independently.

EXTEND AND APPLY

Have students describe different pushes and pulls. Record the student responses in a Tree Map.

ASSESSMENT

As you observe your students, look for the following behaviors:

- Are they engaged in the activities?
- Are they working with their group?
- Are they able to correctly describe that the force was a push or pull?

PUSHING AND PULLING DIFFERENT SIZES OF OBJECTS

BIG IDEA 13: FORCES AND CHANGES IN MOTION

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KEY QUESTIONS

What is a push?
What is a pull?
What force (push or pull) is used to make objects move in a certain direction?

TEACHER BACKGROUND INFORMATION

A force must act upon an object in order for motion to occur. When more force is applied, more movement will be observed. When less force is applied to the same object, less movement will be observed. Push and pull are forces that make movement occur. Push means that the object is moving away from the person pushing and pull means the object is moving towards the person pulling.

MATERIALS

Per group

large playground ball
golf ball
large block
tiny block

SAFETY

- Always follow OCPS science safety guidelines.
- Remind students to not place objects in their mouths.
- Choose objects that do not have sharp edges.
- Remind students not to throw objects.

TEACHING TIPS

Continue using the terms ‘push’ and ‘pull’ throughout the school year. For example, if a student says the wind blew the leaves, ask if that was a push or a pull. If your students are drinking from a straw, ask if that is a push or a pull (pull).

ENGAGE

Ask students to use their hands to show a push. Ask students to use their hands to show a pull. Repeat this several times until all students are pushing and pulling the air with their hands. Ask: *When you push something, what does the object do?* (moves away from me) *When you pull something, what does the object do?* (moves towards me)

EXPLORE

Allow students to push and pull a large playground ball and a golf ball. Circulate the room asking students what happens to an object when you push it (moves away) and what happens to objects when you pull them (moves towards). Require students to demonstrate a push and pull.

EXPLAIN

What is a push? Show me with your hands. *What is a pull?* Show me with your hands*. What happens to an object when we push it? What happens to an object when we pull it? Did the size of the ball matter when we pushed and pulled it? Can you think of something that is too big to make move when we push or pull it? What?*

EXTEND AND APPLY

Repeat the explore and explain portions of this lab using a large block and a tiny block.

ASSESSMENT

As you observe your students, look for the following behaviors:

- Are they engaged in the activities?
- Are they working with their group?
- Are they able to tell you that the force was a push or pull?
- Are they able to describe what happens when an object is pushed or pulled?

PUSHING AND PULLING WITH DOMINOES

BIG IDEA 13: FORCES AND CHANGES IN MOTION

BENCHMARKS AND TASK ANALYSES

SC.K.P.13.1 Observe that a push or pull can change the way an object is moving.
The student:

- identifies a push.
- identifies a pull.
- uses pushes and pulls to move various objects.

SC.K.N.1.3 Keep records as appropriate---such as pictorial records---of investigations conducted.
The student:

- records information, using pictures, journals, or class data tables about classroom investigations.

SC.K.N.1.1 Collaborate with a partner to collect information.
The student:

- works with a partner to gather information during classroom investigations.

KEY QUESTIONS

Can we move a domino using a push?
Can we move a domino using a pull?

TEACHER BACKGROUND INFORMATION

A force must act upon an object in order for motion to occur. When more force is applied, more movement will be observed. When less force is applied to the same object, less movement will be observed. Pushes and pulls are forces that make movement occur. Push means that the object is moving away from the person pushing and pull means the object is moving towards the person pulling.

MATERIALS

Per group
dominoes

SAFETY

- Always follow OCPS science safety guidelines.
- Remind students to not place objects in their mouths.
- Remind students not to throw objects.

TEACHING TIPS

- It may be helpful to do this lesson twice - once with push and once with pull. Push tends to be easy for kindergartners to grasp with dominoes while pull needs a little more practice.

- Continue using the terms 'push' and 'pull' throughout the school year. For example, if a student says the wind blew the leaves, ask if that was a push or a pull. If your students are drinking from a straw, ask if that is a push or a pull (pull).

ENGAGE

Ask students to use their hands to show a push. Ask students to use their hands to show you a pull. Repeat this several times until all students are pushing and pulling the air with their hands. Ask: *When you push something, what does the object do?* (moves away from me) *When you pull something, what does the object do?* (moves towards me)

Show students a handful of dominoes. Ask: *What could I do with these to practice pushing and pulling?* Accept student ideas and place the dominoes in the position students suggest so they have a visual of the words they spoke. Precisely use student description to guide how you demonstrate the placement of the dominoes. When students have correctly described the concept of pushing and pulling, have students to use those ideas to practice pushing and pulling.

EXPLORE

Allow students time to explore push and pull using dominoes. If students did not naturally reach the idea of standing the dominoes up vertically, lead them with guiding questions. *Is there any other way you could put the dominoes on the table? Well, you placed them this way (show them) and this way (show them), but I'm wondering if there is another way to do it?*

EXPLAIN

What did you do to practice push and pull? Allow various students to come up and demonstrate their ideas. Require students to describe the pushing and pulling. *What happens when we push something* (it moves away)*? What happens when we pull something* (it moves closer)?

EXTEND AND APPLY

Allow students to use other materials to demonstrate push and pull. Continue requiring students to describe what happens when you push something (moves away) and what happens when you pull something (moves closer).

ASSESSMENT

As you observe your students, look for the following behaviors:

- Are they engaged in the activities?
- Are they working with their group?
- Are they able to tell you that the force was a push or pull?
- Are they able to correctly describe what happens when an object is pushed or pulled?