

# Educational Resources from *Phenomenon Science Education*

## Student Proficiency Goals for Performance Expectation K-PS2-1



### Information about Performance Expectation K-PS2-1

#### Performance Expectation 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.

#### Clarification Statement.

Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.

#### Assessment Limits.

Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.

#### Science and Engineering Practice (Planning and Carrying Out Investigations)

- With guidance, plan and conduct an investigation in collaboration with peers.

#### Disciplinary Core Idea (PS2.A: Forces and Motion)

- 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.

#### Disciplinary Core Idea (PS2.B: Types of Interactions)

- When objects touch or collide, they push on one another and can change motion.

#### Disciplinary Core Idea (PS3.C: Relationship Between Energy and Forces)

- A bigger push or pull makes things speed up or slow down more quickly. (secondary)

#### Crosscutting Concept (Cause and Effect)

- Simple tests can be designed to gather evidence to support or refute student ideas about causes.

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**SEP (Planning and Carrying Out Investigations):**

- Students plan investigations, with guidance and in collaboration with peers, by identifying ideas about what causes an object to change its speed or direction.
- Students plan investigations, with guidance and in collaboration with peers, by considering what evidence they can collect to determine the causes of changes in speed or direction of an object.
- Students plan investigations, with guidance and in collaboration with peers, by determining how to collect evidence that supports or disproves their ideas about what causes the speed or direction of an object to change.
- Students conduct investigations, with guidance and in collaboration with peers, to compare the effects of pushes of different strengths on the speed and direction of an object.
- Students conduct investigations, with guidance and in collaboration with peers, to compare the effects of pulls of different strengths on the speed and direction of an object.
- Students conduct investigations, with guidance and in collaboration with peers, to compare the effects of pushes in different directions on the speed and direction of an object.
- Students conduct investigations, with guidance and in collaboration with peers, to compare the effects of pulls in different directions on the speed and direction of an object.

**DCI (PS2.A Forces and Motion):**

- Students know that motion can describe both speed and direction.
- Students know that pushes and pulls can have different strengths and directions.
- Students know that pushing or pulling an object can change its motion.
- Students know that pushing or pulling an object can stop its motion.
- Students know that pushing or pulling an object can start its motion.

**CCC (Cause and Effect):**

- Students consider how changes in pushes and/or pulls can cause changes in the motion of objects.
- Students consider simple tests that will generate evidence for how changes in pushes and/or pulls can cause changes in the motion of objects.

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Educational Resources from *Phenomenon Science Education*  
Student Proficiency Goals for Performance Expectation **K-PS2-1**

**DCI (PS2.B Types of Interactions):**

- Students know that when objects touch, those objects push on one another.
- Students know that when objects push on one another, those pushes can change the objects' motion.

**DCI (PS3.C Relationship Between Energy and Forces):**

- Students know that bigger pushes and pulls have a greater effect on the motion of an object.