

Educational Resources from *Phenomenon Science Education*

Student Proficiency Goals for NGSS K-PS2-2



Information about K-PS2-2

NGSS Performance Expectation 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.*

Clarification Statement.

Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.

Assessment Limits.

Assessment does not include friction as a mechanism for change in speed.

Science and Engineering Practice (Analyzing and Interpreting Data)

- Analyze data from tests of an object or tool to determine if it works as intended.

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 (ETS1.A: Defining Engineering Problems)

- A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (secondary)

Crosscutting Concept (Cause and Effect)

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

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

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Student Proficiency Goals for **NGSS K-PS2-2**



Student Proficiency Goals

SEP (Analyzing and Interpreting Data):

- Students collect or receive information about the speed and direction of an object both before and after the object is pushed or pulled.
- Students organize their information about the speed and direction of an object before a push or pull and the speed and direction of an object after a push or pull.
- Students organize their information describing the effect of changing the strength or direction of a push or pull on the speed and direction of an object.
- Students analyze their organized information to describe how changing the strength of a push or pull results in changes in an object's speed and direction.
- Students analyze their organized information to determine how changing the direction of a push or pull affects the speed and direction of an object.
- Students analyze their organized information to determine if an object or tool works as intended to change the speed or 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 start it moving.
- Students know that pushing or pulling an object can change its motion.
- Students know that pushing or pulling an object can stop its motion.

DCI (ETS1.A Defining Engineering Problems):

- Students know that they can approach some situations regarding the motion of objects as engineering problems to be solved.
- Students know that there may be many acceptable solutions to these problems.

CCC (Cause and Effect):

- Students design simple tests to investigate the cause-and-effect relationships between pushes and pulls and an object's motion.
- Students gather and analyze evidence to support or refute a solution to a problem.