

Submitted by: GENERATION CURES

TITLE: NEWTON'S FIRST & SECOND LAWS

SUBJECT: Science

GRADE: 6th

RECOMMENDED TIME: 25-30 minutes

GENERATION CURES CONTENT: Zebrafish Webisode 7-Revelations

LEARNING GOALS:

Students will be introduced to the basics of physics through dodge ball. They should develop an understanding of Newton's first and second laws of motion—the laws of inertia and acceleration. The terms motion, velocity, acceleration, and inertia will be relevant. The aim here is to help students understand and define the actions they produce by creating a “behind-the-scenes” chart.

RESOURCES/MATERIALS NEEDED:

- Computer / Internet / Projector
- Pen / Pencil / Paper
- Zebrafish Webisode 7-Revelations (www.kids.generationcures.org)
- Dodge ball or another soft ball
- Wall- preferably exterior
- Dictionary: define terms
 - Motion- the movement of an object through space
 - Velocity- the speed and direction of an object in motion.
 - Acceleration- a change in the velocity of an object in motion. Frequently used to indicate an increase in velocity, or ‘speeding up;’ a decrease in velocity can be referred to as ‘negative acceleration,’ also called ‘deceleration.’
 - Inertia- a physical law stating that unless an external force is applied, an object will tend to resist a change in its velocity; thus an object at constant velocity would continue to move in a straight line, while a motionless object would remain still.

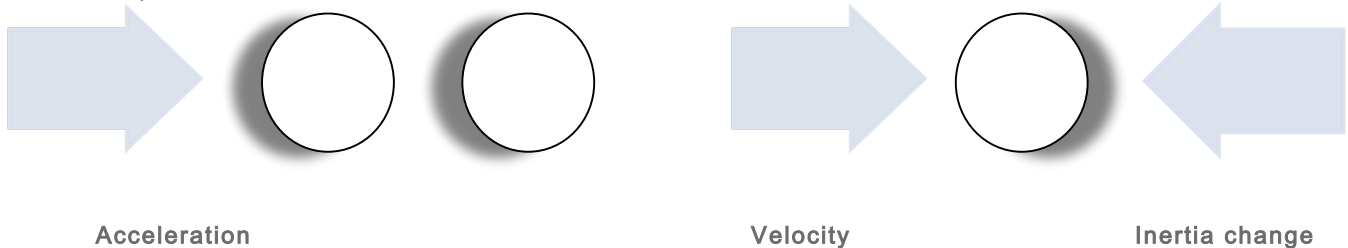
BACKGROUND:

Jay skips his asthma medicine. No big deal. Until he learns that playing dodge ball in gym is easier than dodging his disease. It takes his breath away... and that's no game. In this webisode, not only is Jay dodging things, but Plinko gets in on the game.

LESSON STEPS:

- While students are watching Webisode 7: “Revelations” ensure they note the scenes where Jay and Plinko are playing dodge ball. Instruct them to make a mental note of the motion of the dodge balls and the change they undergo in Plinko’s imagination. They turn into blowfish when Plinko is daydreaming.
- Write the first two laws of motion on the board:
 - The law of inertia states that unless external force is applied, an object in motion continues to move with constant velocity (speed and direction), while a motionless object remains still.
 - The second law of motion is known as the law of acceleration. Acceleration is the change of the rate of motion (or velocity) of an object. It is dependent upon the object’s mass and the amount of force applied to the object.
- Demonstrate with students what happens when you throw a dodge ball at the wall by throwing a dodge ball against a wall. Explain that what they witnessed:
 - While the dodge ball was in flight towards the wall, its speed and direction (velocity) remained relatively constant until it hit the wall. At that point, the ball’s inertia was impacted by the force of the motionless object- the wall.
 - The ball initially accelerated as a result of the force applied by the person throwing the ball.
- **Playing and Learning:** Allow students to take turns throwing the ball at different speeds at the wall, keeping in mind other classes nearby or on the other side of the wall. Perhaps set up a dodge ball game if you have access to a gym.
- When students return to their seats, have them begin a drawing depicting the first two laws of motion.

Example:



EXTENSIONS:

- Ask students to begin to study Newton’s final law of motion—action and reaction. Students should keep their previous drawing of the first two laws of motion so that they can return to it and draw the final law of motion the next day.