

August 21, 2014

- 9** The characteristic for having dimples (D) is dominant to the characteristic for not having dimples (d). A Punnett square showing a cross between a dimpled person and a non-dimpled person is shown below.

	D	d
d		
d		

What percentage of the offspring from this cross will most likely have dimples?

- A 25%
- B 50%
- C 75%
- D 100%

You must explain why your answer is correct.

Please write the page number in your book that supports your explanation.

Use the index of your book to help you.

Chapter 13
(Lesson 3) Day 9

CHAPTER 13 LESSON 3

Isaac Newton

Newton's Laws of Motion

Molly Con/pd. 9/Science

For more videos about the laws of motion, click here.

Click on my face for a video about the three laws of motion!!

Newton's First Law (The Law of Inertia)
An object at rest remains at rest, and an object in motion remains in motion at constant speed and direction.

Newton's Second Law (The Law of Force)
The acceleration of an object depends on the mass of the object and the size of the net force applied.

Newton's Third Law (The Law of Action and Reaction)
When a force is applied to an object, the object exerts an equal and opposite force.

What are the Laws of Motion?
Before the 1600s, people thought that objects slowed down and stopped by themselves. It wasn't until 1686 that Isaac Newton discovered the laws of motion.

Who is Isaac Newton?
Isaac Newton is remembered for developing the calculus, his law of gravitation and his laws of motion.

I can identify how Newton's laws of motion relate to the movement of objects.

What You Will Learn

- How balanced forces affect motion
- What Newton's first law says
- How it looks in real life

What Mastery Looks Like

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Which is the best example of Newton's first law of motion?

- A** A basketball thrown in the air falls to the ground.
- B** A soccer ball remains motionless until it is kicked by a player.
- C** A baseball player swings at an approaching ball.
- D** An ice skater pushes off from a wall and moves backwards.

Why it's Important


- Newton's three laws explain how forces cause motion to change.

I. Newton's Laws of Motion


- Changes in motion are caused by the forces that act on them.
 - ex. Galaxies in the universe, planets in the solar system, and cars on a busy street
- Laws were first presented by Sir Isaac Newton – 1687.
- These rules apply to all objects

THE THREE LAWS OF MOTION


Before the 1600's, people thought that objects slowed down and stopped by themselves until. Sir Isaac Newton English scientist, published his book *Principia* in 1686 it related forces to the motion of objects he also put many different ideas together in a way it could be understood



Newton's Laws



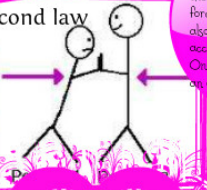
First law



Newton's first law states An object at rest remains at rest, and an object in motion remains in motion at constant speed and in a straight line, unless acted on by an unbalanced force.

This crash-test dummy shows the effect of inertia. If a car stops suddenly, the forward motion of people in the car continues. The force that stopped the car does not stop the people. The force of a seat belt or air

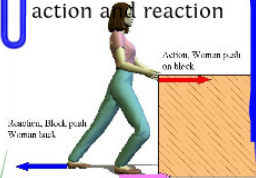
Second law



The acceleration of an object depends on the mass of the object and the size of the force applied. $a = \frac{F}{m}$ also wrote as an equation $acceleration = \frac{force}{mass}$ Only unbalanced force on an object to accelerate

The force of the snowplow causes the ice and snow to accelerate. If the force of friction equals the force of the snowplow, the ice and snow will not accelerate.

Third law also known as action and reaction



When a force is applied to an object, the object exerts an equal force in the opposite direction. momentum depends on its mass and velocity.

Action: Woman push on block
Reaction: Block push Woman back

Static friction, between shoe and floor

A falling ball exerts a downward force on the ground, and the ground exerts an equal but upward force on the ball. The push of the ground causes the ball to bounce upward.

II. The First Law of Motion

- How does an object move if the forces acting on it are balanced?
- If the forces acting on an object are balanced, then an object at rest remains at rest and an object in motion keeps moving in a straight line with constant speed.
- When the forces on an object are balanced, the motion of the object doesn't change

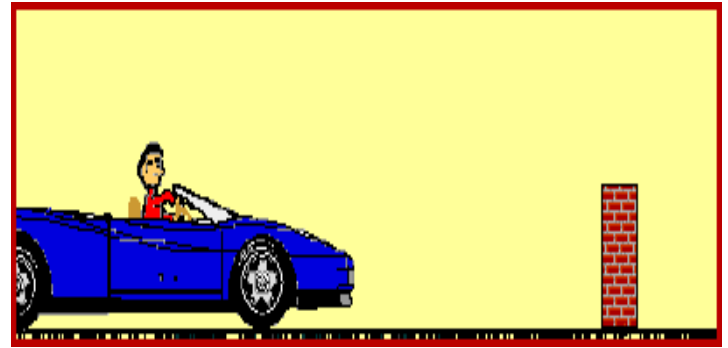
WITH NO OUTSIDE FORCES
THIS OBJECT WILL
NEVER MOVE



WITH NO OUTSIDE FORCES
THIS OBJECT WILL
NEVER STOP



II. First Law of Motion cont.



- Why does the net force acting on the basketball in Figure 14 cause it to move in a curved path? see 410
- According to the first law, the **net force** acting on the object must not be zero for an object to change speed or direction.
- https://www.youtube.com/watch?v=t8WEcA_VqHQ

A. Changing Direction

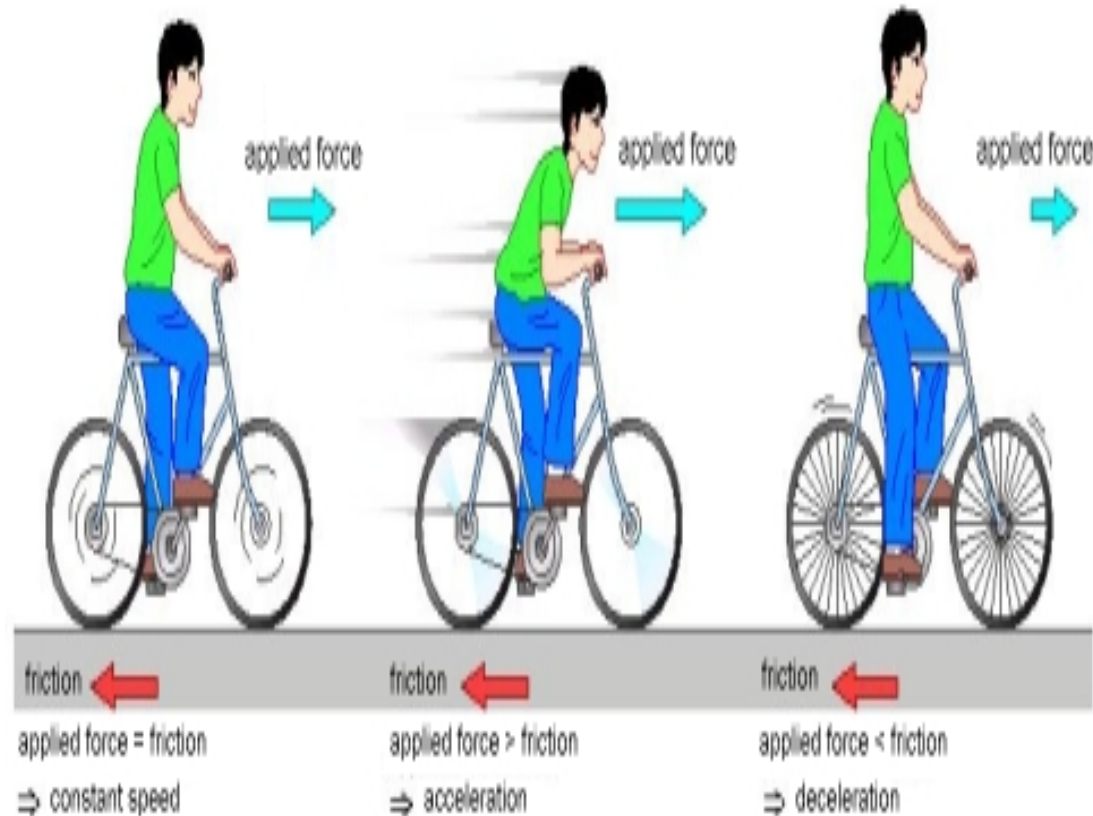
1. A moving obj. changes direction when the net force acting on the obj. is not in the same direction as the object's motion.
2. Then, the direction of motion curves toward the direction of the unbalanced force.
see 410 Figure 14



II. First Law of Motion cont.

B. Changing Speed

- If the net force is in the same directions in which the object is moving
 - It speeds up and continue to move in a straight line.
- If the net force acts in the direction opposite to an object's motion
 - the object slows down and moves in a straight line.



Exit Ticket

- If I want to keep an object moving, do I need to keep applying a force?

A. Objects eventually stop because a force – such as friction or gravity- acts against the object's motion. Once an object is in motion, the energy that was used to initiate the motion is irrelevant. In the absence of forces acting against that motion, a moving object would, in fact, continue to move forever! This is true of a bouncing ball, a speeding care, a galloping horse and a shooting star.