

Learning Target: I can use Newton's Laws of Motion to explain how balanced and unbalanced forces affect an object's motion.

### Newton's Laws Balanced & Unbalanced Forces Video Notes

#### **PART 1: WHAT ARE FORCES?**

A force is a \_\_\_\_\_ or a \_\_\_\_\_ that can change an object's \_\_\_\_\_.

Forces can:

- \_\_\_\_\_ motion
- Stop motion
- \_\_\_\_\_ objects up
- \_\_\_\_\_ objects down
- Change \_\_\_\_\_

But here's the key idea: It's not just about how \_\_\_\_\_ a force is—it's about how forces work \_\_\_\_\_.

That's where balanced and unbalanced forces come in.

#### **PART 2: BALANCED FORCES**

Balanced forces occur when forces acting on an object are \_\_\_\_\_ in size and \_\_\_\_\_ in direction. When forces are balanced:

- The net force is \_\_\_\_\_

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- Motion does \_\_\_\_\_ change

That means:

- An object at rest stays at \_\_\_\_\_
- An object in motion keeps \_\_\_\_\_ at the same \_\_\_\_\_ and \_\_\_\_\_

This perfectly matches Newton's First Law of Motion, also called the Law of \_\_\_\_\_. Newton's First Law says: An object will remain at rest or in uniform motion unless acted on by an \_\_\_\_\_ force. For example: A book resting on a table doesn't move because \_\_\_\_\_ pulling down is \_\_\_\_\_ by the table \_\_\_\_\_. No net force. No change in \_\_\_\_\_.

### PART 3: UNBALANCED FORCES

Unbalanced forces occur when forces acting on an object are not \_\_\_\_\_.

When forces are unbalanced:

- The net force is \_\_\_\_\_ zero
- The object's motion \_\_\_\_\_

This could mean:

- Speeding up
- \_\_\_\_\_ down
- Changing \_\_\_\_\_
- Starting or stopping \_\_\_\_\_

This connects directly to Newton's Second Law of Motion. Newton's Second Law says: The acceleration of an object depends on the \_\_\_\_\_ acting on it and its \_\_\_\_\_.

In simple terms:

More force = \_\_\_\_\_ acceleration

More mass = \_\_\_\_\_ acceleration

For example: Kicking a soccer ball causes it to \_\_\_\_\_ because the force from your foot is \_\_\_\_\_, changing the ball's \_\_\_\_\_.

### PART 4: NEWTON'S THIRD LAW & FORCES

Newton's Third Law of Motion helps explain how forces always work in pairs. Newton's Third Law says: For every action, there is an equal and \_\_\_\_\_. When you push on an object:

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- The object pushes back on you with \_\_\_\_\_ force
- These forces act on \_\_\_\_\_ objects

For example:

When a skateboarder pushes \_\_\_\_\_ on the \_\_\_\_\_, the ground pushes the skateboarder \_\_\_\_\_ causing \_\_\_\_\_.

#### PART 5: PUTTING IT ALL TOGETHER

Let's construct a full explanation:

- Balanced forces result in no change in \_\_\_\_\_ because the net force is \_\_\_\_\_ (Newton's \_\_\_\_\_ Law).
- Unbalanced forces cause a change in \_\_\_\_\_, such as \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ change (Newton's \_\_\_\_\_ Law).
- Forces always occur in \_\_\_\_\_ that act on \_\_\_\_\_ objects (Newton's \_\_\_\_\_ Law).