


FORCE & MOTION



Click this icon anywhere you see it to always return to this homepage

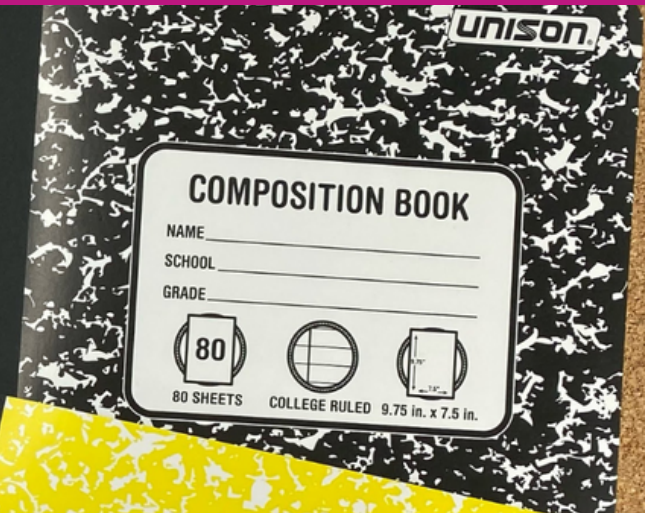
FORCE & MOTION

- What is Motion?
- Changes in Motion
- An Invisible Force
- Laws of Motion
- Force & Energy

Click a topic above to learn more.

When you're done exploring, Click the  for the Brain Burst Challenge!

BRAIN BURST!



LNK  **Activity**
Interactive Learning Guides

WAIT!

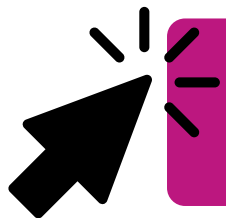
Thank you for considering this LINKtivity for your classroom, but before you make a decision - you should know that you can get **access to this LINKtivity + PLUS our entire library** for about the same price as a single LINKtivity!

The results are in: **Teachers LOVE LINKtivities...** and want more! So, we've made it SUPER easy and cost effective for you to access any and ALL of our LINKtivities inside our LINKtivity Learning membership option! Instead of purchasing just ONE LINKtivity - why not get access to ALL of them... for about the SAME PRICE!



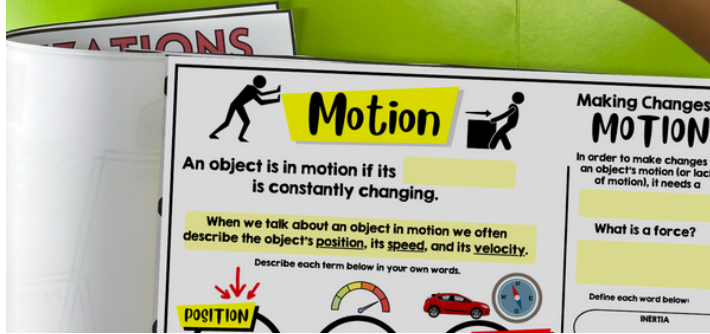
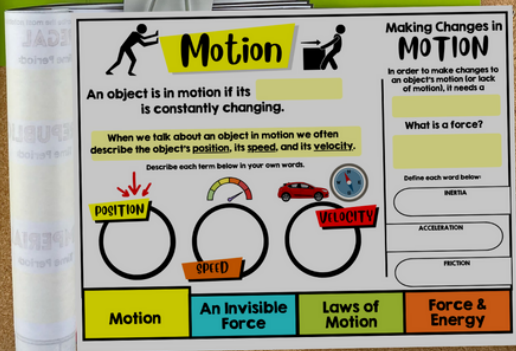
INSIDE THE MEMBERSHIP YOU'LL HAVE UNLIMITED ACCESS TO:

- ✓ The **entire growing LINKtivity® library** inside the Membership (LINKtivities for all content areas)
- ✓ ALL **future LINKtivities** to be added to the membership (new releases each month!)
- ✓ **Teacher guides** to help you set up each LINKtivity® successfully in your classroom
- ✓ **Student resources** that go along with each LINKtivity (printable OR digital)
- ✓ **Kid-friendly rubrics** and **answer keys** for each LINKtivity®



JOIN NOW





Inside the Force and Motion LINKtivity®, students explore how force and motion relate and what causes change in motion. They will explore Newton's 3 Laws of Motion, the forces of gravity and friction, as well as potential and kinetic energy. Students will also explore several related videos before completing the knowledge self-check.



More Sample Slides

An Invisible Force

Check This Out!

Gravity depends on 2 things: the **mass** (amount of matter in an object), and the **distance** between the objects. The mass of the Earth is **HUGE**, so its gravitational force pulls strongly on all objects. The further an object moves away from Earth, the less gravitational force it will have on the object.

There is an invisible force that's at work right now - and it's even working on you! It's called gravity! **Gravity is an invisible force that pulls objects together.** Gravity is the reason why a ball that is thrown up into the air will eventually fall back to Earth. The force of gravity pulls it back down. Or - it's the reason an apple will fall from a tree (and not float in air!)

Click the video to learn more about gravity.

BIO SNAPSHOT

BORN

Isaac Newton was born on January 4, 1643 in England. His father died before he was born and his mother remarried. He was raised by his grandmother.

EDUCATION

Newton was always curious. He attended grammar school and eventually college at Cambridge University. He became interested in science and how things work.

SCIENTIFIC WORK

Newton is credited for his discoveries around how gravity pulls objects toward Earth. He also developed ideas for how motion and forces are related to each other and developed the laws of motion. As he studied motion, Newton also made important discoveries related to math.

Laws of Motion

Over 300 years ago an English scientist named Sir Isaac Newton studied how forces and motion related to each other. Today, we call this the **laws of motion.**

The laws, or rules, of motion explain how objects respond to forces. Forces can affect the motion of an object. When two objects apply equal forces, the forces cancel out and the objects will not move. However, if one force is greater than the other, it becomes unbalanced, causing a change in motion.

Click on Newton to learn more about his life.

Click on each law of motion below to learn more.

- First Law of Motion
- Second Law of Motion
- Third Law of Motion

Laws of Motion

Over 300 years ago an English scientist named Sir Isaac Newton studied how forces and motion related to each other. Today, we call this the **laws of motion.**

Newton's **first law of motion** tells us that an object's motion (or lack of motion) won't change unless a force causes it to do so. This law is sometimes called the **Law of Inertia.** A soccer ball sits on a field. The ball is not in motion and is at rest. It will stay at rest until a force causes it to move and change from a resting state to a motion state. The person kicking the ball applies a pushing force to put the ball into motion. The ball will stay in motion until another force stops it. Can you think of a force that can be applied to stop the ball?

What force can be applied to STOP the soccer ball?
CLICK HERE to find out.

Force & Energy

Energy is the ability to do work. That means, energy is needed to apply a force to an object in order to start or stop motion. When it comes to force and motion, there are two types of energy: **potential** and **kinetic.**

- Potential energy** is stored energy. This means it has the potential to do work in the future.
- Kinetic energy** is energy in motion. When an object is moving, it can do work.

Click on the video icon to learn how roller coasters put potential and kinetic energy to work.

CLICK HERE to see roller coasters in action!

Roller Coasters in Action!

Click on each number on the roller coaster to see how potential and kinetic energy work together.

As the roller coaster car works its way up the hill, its **potential energy** is rising.

As the pulling force moves the car higher and higher, the potential energy continues to increase. The higher it goes, the more potential the car will have to move with greater force down the hill.

BRAIN BURST!

Test your knowledge of force and motion by completing each activity below.

- MATCH-UP**
- LAWS OF MOTION**
- TYPES OF ENERGY**

MATCH-UP

Drag each vocabulary word to the correct definition.

the location of an object	acceleration
the distance an object moves in a specific amount of time	friction
an object's speed AND direction of motion	speed
a push or a pull on an object	force
an invisible force that pulls objects together	gravity
the tendency for an object to stay moving, or stay at rest	inertia
any change in speed or direction	velocity
a force that works against motion	position

CLICK HERE to Check Your Answer

UNDO RESET

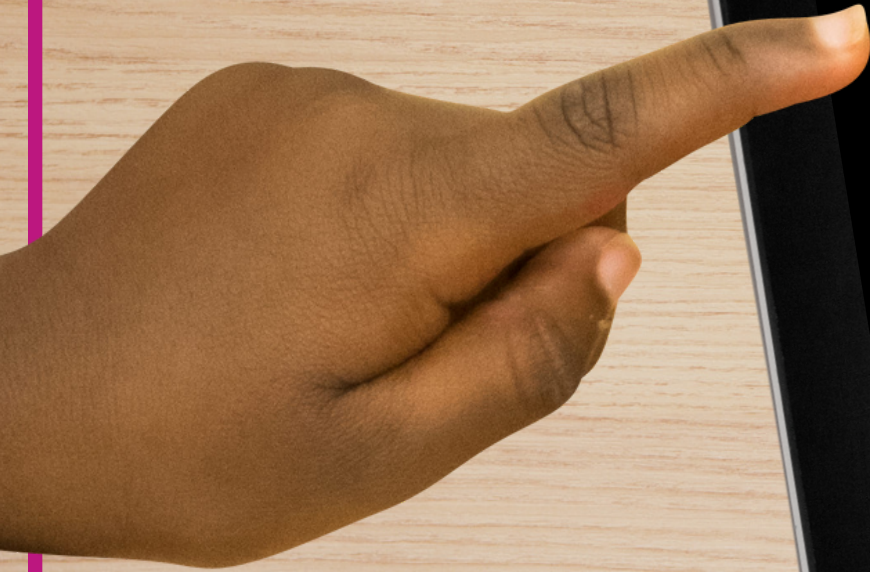
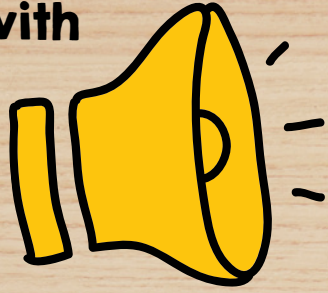
TYPES OF ENERGY

Look at each card below and decide if the object has potential or kinetic energy. Then, flip the card over the find out if you were right!

- A roller coaster car zooms down the track. (Kinetic)
- A car sits in traffic. (Potential)
- A bike reaches the top of a hill and pauses before going down the hill. (Potential)
- A baseball flies through the air. (Kinetic)
- A golfer gets ready to strike a golf ball. (Potential)
- A yo-yo quickly winds back up on the string. (Potential)
- A boy pulls back on the bow before releasing the arrow. (Potential)
- An apple falls from a tree. (Kinetic)
- A soccer ball sits on the grass. (Potential)
- A ball is tossed up in the air. (Potential)

This LINKtivity is provided with

AUDIO SUPPORT



What is Motion?

This athlete is in motion as she goes over the hurdle.

An object is in **motion** if its location is constantly changing. A ball rolling down the hill is in motion because it starts at the top and ends at the bottom.

When we talk about an object in motion we often describe the object's position, its speed, and its velocity.

Click on each tab below:

- POSITION
- SPEED
- VELOCITY

The tablet screen features a blue background with a red banner at the top containing the title 'What is Motion?'. On the right, a photograph shows a female athlete in a red uniform jumping over a hurdle. A speech bubble next to her says, 'This athlete is in motion as she goes over the hurdle.' In the center, a speech bubble explains motion: 'An object is in motion if its location is constantly changing. A ball rolling down the hill is in motion because it starts at the top and ends at the bottom.' To the left, a young boy is shown with his arms crossed, leaning on a stack of books. Another speech bubble next to him says, 'When we talk about an object in motion we often describe the object's position, its speed, and its velocity.' Below this, a yellow box says 'Click on each tab below:' followed by three colored tabs: a yellow one for 'POSITION', an orange one for 'SPEED', and a red one for 'VELOCITY'. The tablet also has several audio icons: a speaker icon in the top left, a speaker icon with sound waves in the middle left, and a hand icon in the bottom left. A hand is shown pointing at the speaker icon with sound waves.

Perfect for English language learners or students who could use a little extra support!



KNOWLEDGE CHECK




Students complete a quick self-check at the end of the LINKtivity to show what they have learned!

LAWS OF MOTION

Read the scenario below. Click on the law of motion that it best relates to.
If you need help, click to review each law.

A heavy wagon full of pumpkins moves faster when two people pull it, rather than one person.



First Law of Motion

Second Law of Motion ✓

Third Law of Motion

Correct! Click Continue to Move On!



Printable & Digital Student Flipbook

Printable Flipbook for LINKtivity

FORCE & MOTION

By: _____

Motion

Making Changes in MOTION

An object is in motion if its is constantly changing.

When we talk about an object in motion we often describe the object's **position**, its **speed**, and its **velocity**.

Describe each term below in your own words.

Define each word below:

POSITION: _____

SPEED: _____

VELOCITY: _____

What is a force?

Define each word below:

NETS: _____

ACCELERATION: _____

FRICITION: _____

An Invisible Force

Gravity is...

Gravity depends on 2 things: _____ & _____

The mass of the Earth is HUGE, so its gravitational force pulls strongly on all objects.

Therefore, an object moves away from Earth, the gravitational force it will have on the object.

Where do you see gravity at work?

The laws, or rules, of motion explain how objects respond to _____

Describe each law of motion below:

FIRST LAW What does it tell us? _____

SECOND LAW What does it tell us? _____

THIRD LAW What does it tell us? _____

Real life example: _____

Real life example: _____

Real life example: _____

Laws of Motion

Energy is...

Potential Energy is: _____

Kinetic Energy is: _____

Give detailed or specific energy when the car is at the top of the hill in terms of Potential Energy Kinetic Energy

1 At the bottom of the hill, the car has Potential Energy Kinetic Energy

2 As the car works its way up the hill, which type of energy is rising? Potential Energy Kinetic Energy

3 When the car reaches the top of the hill it has Potential Energy Kinetic Energy

4 As the car races down the hill it has Potential Energy Kinetic Energy

5 Once the car reaches the bottom the energy is changed into Potential Energy Kinetic Energy

Force & Energy

Energy is...

Potential Energy is: _____

Kinetic Energy is: _____

Force & Energy

1 At the bottom of the hill, the car has Potential Energy Kinetic Energy

2 As the car works its way up the hill, which type of energy is rising? Potential Energy Kinetic Energy

3 When the car reaches the top of the hill it has Potential Energy Kinetic Energy

4 As the car races down the hill it has Potential Energy Kinetic Energy

5 Once the car reaches the bottom the energy is changed into Potential Energy Kinetic Energy

Motion **An Invisible Force** **Laws of Motion** **Force & Energy**

Digital Flipbook for LINKtivity in Google Slides

In Action!

Click the numbers below:

1 How do you make something move? Well, you either push or pull the object, a push or a pull is a force. In order to make changes to objects in motion, needs pushing & pulling force. Force can cause an object to start or stop moving.

2

3

Motion

Making Changes in MOTION

An object is in motion if its is constantly changing.

When we talk about an object in motion we often describe the object's **position**, its **speed**, and its **velocity**.

Describe each term below in your own words.

Define each word below:

POSITION: _____

SPEED: _____

VELOCITY: _____

What is a force?

Define each word below:

NETS: _____

ACCELERATION: _____

FRICITION: _____

Motion **An Invisible Force** **Laws of Motion** **Force & Energy**

Student Flipbook Rubric

	4 - Excellent	3 - Good	2 - Satisfactory	1 - Needs Improvement
Neatness & Appearance	My Flipbook is very neat and easy to read. I neatly colored in my illustrations with great detail. It is clear that I took my time to make my Flipbook reflect my learning.	My Flipbook is neat and my writing is easy to read. I neatly colored in my illustrations.	My Flipbook is somewhat neat. Some of my writing is hard to read. I colored in my illustrations.	My Flipbook is quite sloppy. My writing is hard to read. Illustrations are NOT colored, or are sloppily done.
Accuracy & Completeness	The information in my Flipbook is 100% correct. I've included many details from the LINKtivity and have put what I've learned clearly in my own words. I have included information that goes above and beyond.	The information in my Flipbook is mostly correct. I've included several details from the LINKtivity, written neatly in my own words. My Flipbook includes all of the required written above and beyond.	My Flipbook contains several incorrect or missing pieces of information. I struggled to use the information from the LINKtivity to complete my Flipbook correctly.	My Flipbook has many incorrect or missing pieces of information. I struggled to use the information from the LINKtivity to complete my Flipbook correctly.
	My Flipbook contains very few errors in spelling and grammar.	My Flipbook contains some errors in spelling and grammar.	My Flipbook contains many errors in spelling and grammar.	My Flipbook contains many errors in spelling and grammar.

Motion

An object is in motion if its **location** is constantly changing.

When we talk about an object in motion we often describe the object's **position**, its **speed**, and its **velocity**.

Describe each term below in your own words.

POSITION: the location of an object

SPEED: the distance an object moves in a specific amount of time

VELOCITY: describes an object's speed and direction of motion

Motion

Making Changes in MOTION

In order to make changes to an object's motion (or lack of motion), it needs a **force**

What is a force?

a push or a pull

Define each word below:

NETS: the tendency for an object to stay moving, or stay at rest

ACCELERATION: any change in speed or direction

FRICITION: a force that works against motion

Answer Key & Rubric



BONUS RESOURCES

Lesson Plan

LESSON

ESSENTIAL QUESTIONS:

- What is a force?
- How does force impact motion?



Standards Covered

3.PS2.1, 3.PS2.2, 4.PS3.3,
5.PS2.1, MS.PS2.1,
MS.PS2.2, MS.PS2.4

Materials Needed

Force & Motion LINKtivity®
Force & Motion student flipbook
Push & Pull Pictures
Chart paper/markers

Teacher Preparation

Preview the Force & Motion LINKtivity® and plan for how you will share the LINKtivity with students (ex. assign link in Google Classroom, prepare QR codes, etc)
Make copies of the flipbook (optional).
Print and cut out the push and pull pictures. Create an anchor chart and organize it as a Venn Diagram, with "PUSH" on the left, "PULL" on the right, and "BOTH" in the center.

Lesson Introduction (5-10 min.)

- Introduce the essential questions.
- Choose a volunteer to stand still. ASK: "What is this person doing?" (standing still). ASK: "Is he/she moving?" (no). Gently pull a student toward you and ASK, "What just happened?" (the teacher pulled them forward). Prompt with questions like, "What was the force in this situation?" or "What was the motion?"
- Discuss the concept of push vs. pull. Then, using the prepared **Venn Diagram anchor chart**, organize the **push & pull cards** correctly. For each card, engage in a discussion about the motion(s) that is occurring and identify the force responsible for that motion.

Lesson Activity (20-30 mins)

Have students complete the **Force & Motion LINKtivity®**. While navigating the LINKtivity, students have the option to complete the **flipbook**.

Optional Extension Activities

- Roller Coaster STEM:** Have students design a roller coaster using everyday objects like cardboard, paper towel tubes, tape, marble, etc. to illustrate different concepts of force & motion.
- Force & Motion Journal:** Encourage students to keep a journal documenting everyday occurrences related to force and motion.
- Paper Airplane Challenge:** Students can create and modify paper airplanes to explore how changes in design affect the forces and motions of the airplanes.

Lesson Conclusion (2-5 min.)

Review essential questions and have students share their responses in light of what they have learned.

PUSH CARDS



BOTH CARDS



place these cards on the BOTH section of the Venn Diagram

PULL CARDS



place these cards on the PULL section of the Venn Diagram

