

EDUFRIENZ®

STEM FORCE *and* MOTION



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Introduction

This issue is part of the Edufrienz Library of Learning and Activities. We have created this exclusive content to support your children's learning and development.

Get ready to think like a physicist! Edufrienz created this STEM series to test children's problem-solving and creativity skills. Using the principles of STEM (Science, Technology, Engineering, and Math), children will explore various science and technology concepts. The goal is to have fun, learn, and see what they can discover and create!

This Force and Motion worksheet, part of our exciting STEM series, is designed to delve into the fascinating world of physics. Children will explore electrostatic force, build a catapult, conduct a rolling race, observe a pendulum swing, and experiment with spinning tops to understand the principles of motion and the forces that make things move.

No. of Pages: 21

Recommended for Ages: 7 years old and above

Activity Outcome:

Through this activity, children will be able to explore key concepts of physics including electrostatic force, gravity, friction, and kinetic energy by building a catapult, conducting a rolling race, observing a pendulum, and experimenting with spinning tops.

FORCE and MOTION

The way objects move and interact with each other.

FORCE

Force is a push or pull that can make an object move.

Push

Move something away from you.

Pull

Bring something closer to you.



TYPE OF FORCE

CONTACT FORCE

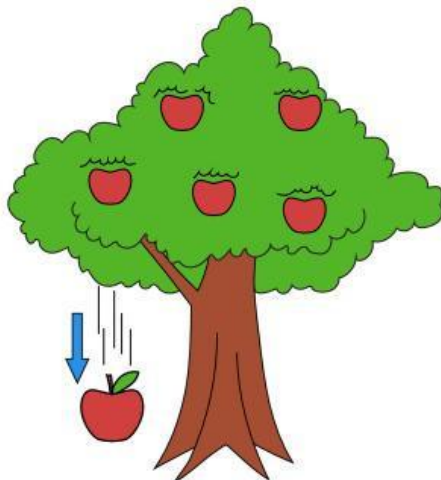
When two objects are touching each other.



You open the door.

non-CONTACT FORCE

When objects affect each other without touching.



The apple falls from the tree.

STEM Challenge 1:

Exploring Electrostatic Force

To explore how static electricity can create a force that pulls or repels objects without touching them.

Learn: Understand how static electricity works with everyday materials.

What you need:

- 1 glass jar with lid (or a clear cup with a cover)
- hot water (with adult help)
- ice cubes
- hairspray (or aerosol spray)
- metal or ceramic plate (if no lid is available)
- towel (for safety)



What To Do:

1. Rub the balloon on a wool cloth or sweater for 20–30 seconds.
2. Then, hold the balloon close to the small pieces of paper on a flat surface.
3. Watch what happens to the paper.
4. (Optional) Turn on the faucet and let water run slowly. Hold the balloon near the stream and observe what happens.
5. Rub the balloon on your hair for about 20 seconds.
6. Hold the balloon near your own hair or a friend's.
7. Watch how the hair reacts.

Think Like A Scientist!

Answer the following questions in a complete sentence.

1. What happened when you held the balloon near the paper?

2. Why do you think the balloon made your hair stand up?

3. Did the water move when you held the balloon close? What caused that?

4. What do you think will happen if you rub the balloon for a longer or shorter time?

5. Can you name other things at home that might create static electricity?

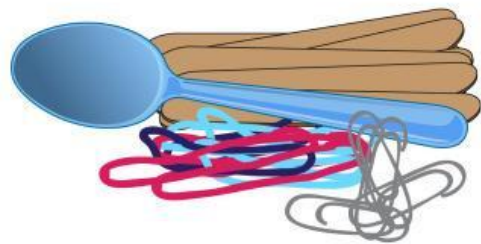
STEM Challenge 2: Build a Catapult (Contact Force)

Build a simple tool (catapult) to launch objects.

Learn: Learn how forces like compression and tension help move objects using a catapult.

What you need:

- Popsicle sticks (6 to 10)
- Rubber bands (3 or more)
- Small spoon (plastic)
- Paper clips or small soft objects to launch



What To Do:

1. Stack five or six popsicle sticks together and tie them together at both ends with rubber bands.
2. Take two more sticks. Place one on top of the stack and secure it with a rubber band.
3. Slide the stack of sticks between the two sticks holding the spoon to make a "T" shape.
4. Use rubber bands to hold the "T" shape together tightly.
5. Place a small paper clip or soft object in the spoon.
6. Gently press the spoon down with your finger.
7. Let go and watch your object fly!

Think Like A Scientist!

Try launching different objects or pressing the spoon harder/softer. Write or draw what happens below:

Answer the following questions in a complete sentence.

1. What happened when you let go of the spoon?

2. What made the object fly through the air?

3. What forces were used in the catapult?

4. What could you change to make the object go farther?

5. Can you think of other real-life tools or machines that use similar forces?

FORCE and MOTION

MOTION

Motion is when something is moving from one place to another.



Motion happens because of force.



Motion can be fast or slow.

Fast Motion – means getting from one place to another very quickly.

Example: You are running as fast as you can in a race.

Slow Motion – means taking a long time to move from one place to another.

Example: Snail crawling along a leaf.

Motion can occur in different directions. It can be forward, backward, sideways, or up and down.

1. Forward – Moving straight ahead.

Example: Riding your bike down the street to the park.



2. Backward – Moving in the opposite direction.

Example: Rowing a boat backward



3. Sideways – Moving to the left or right.

Example: Sliding to the left or right during a dance move.



4. Up and Down – Moving higher and moving lower.

Example: Jumping up to reach a ball.

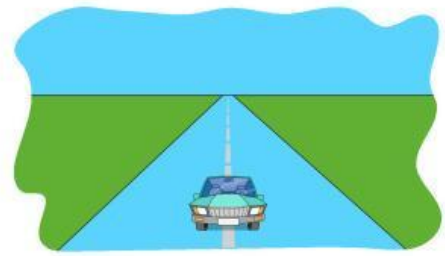
Going Down a Slide



TYPES OF MOTION

Linear motion

means something moves in a straight line.



Circular motion

is when something moves in a circle in one direction.



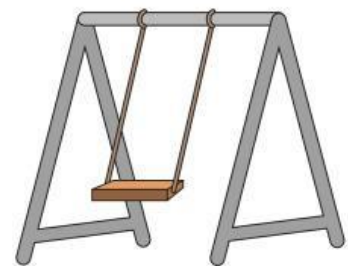
Rotatory motion

happens when something spins around in any direction.



Periodic motion

shows that something moves back and forth in the same way over and over.



Random motion

means moving in different directions without any pattern.



STEM Challenge 3: Rolling Race

Use tools to measure distance and test designs.

Learn: Learn how objects move in a straight line and how different surfaces affect their movement.

What you need:

- toy cars or small balls
- measuring tape or ruler
- masking tape
- stopwatch or timer (optional)
- different floor surfaces (like tile, carpet, wood)



What To Do:

1. Use masking tape to create a straight track about 1–2 meters long on the floor.
2. Place a toy car or ball at the start of the track.
3. Gently push the car or roll the ball, then let it move on its own.
4. Use a measuring tape to see how far it went.
5. (Optional) Use a stopwatch to time how long it takes to reach the end.
6. Try the same test on different floor surfaces (like carpet, wood, or tile).
7. Repeat with different cars or balls if you want.

Think Like A Scientist!

Record your observation on the table below.

Object	Surface Tested	Distance Move	Did it go straight?	Was it fast or slow?