

Grade 5 Science  
Week of January 18 – January 22

Forces

**Force and Motion**

When you push someone on a swing, why do they swing forward? Why is it so easy to throw a tennis ball, but so difficult to throw a bowling ball? When you drop your pencil, why does it fall to the ground? Why do rockets fly upwards when they shoot gasses downwards?

Did you know that our world and our universe are governed by laws, laws that can answer the questions above? Physicists study these laws, which are called **The Laws of Nature**. Force and motion are both part of these laws



What is force you ask? Well, A force is **the push, or pull of an object**.

- *Pushing* an object will move it **away from** the force. **Example:** When you jump in the air, you *push* yourself down, off the ground, causing your body to go up.
- *Pulling* an object will move it **towards** the force. **Example:** Gravity is a force that *pulls* everything towards the earth. So when you jump, gravity is what pulls you back down.



**We cannot see a force, but we can see the *effects* of a force**

Forces can help an object speed up, slow down, stay in place, or even change shapes; forces cause motion or a lack of motion. To change an object's motion, a force needs to be applied. So if a rock was in place, still, not moving, chilling, and living its life, a force would have to come along in order for it to move (because a rock can't move on its own!). Make sense?

Think about when you ride your bike. It doesn't move on its own! The force of your feet *pushing* against the pedals causes your wheels to turn and your bicycle to move **forward**. When you want to stop, you *pull* the brakes, thus applying a *force* that is strong enough to **stop your motion**.

All forces are measured in something called **Newtons** - Named after Isaac Newton who discovered much of what we know now about force and motion. But don't think too much about him just yet, we'll learn more in the coming chapters.

Watch these short videos to further understand force and motion. Make sure you follow along in your learning guide!



Force and Motion: <https://youtu.be/fnCDk-SnNGQ>



Swings, Slides, and Science: <https://youtu.be/JvSCIZ3vHOI>



Gravity, Force, and Work: <https://youtu.be/LEs9J2IQIZY>

# Physics

## Learning Guide

Name: \_\_\_\_\_

### *Instructions:*

Using a pencil, complete the following notes as you work through the related lessons. Show **all** of your work. This learning guide needs to be completed before you write your unit test. Do your best and ask questions if you don't understand anything!

## 3.1 Forces

1. Our world and our universe are governed by laws that are called:
  - a) The Laws of the Universe
  - b) The Laws of Life
  - c) The Laws of the World
  - d) The Laws of Nature

2. What is a Force?

\_\_\_\_\_

3. Give 1 example (that has not already been given in this chapter) of a pushing force.

\_\_\_\_\_  
\_\_\_\_\_

4. Give 1 example (that has not already been given in this chapter) of a pulling force.

\_\_\_\_\_  
\_\_\_\_\_

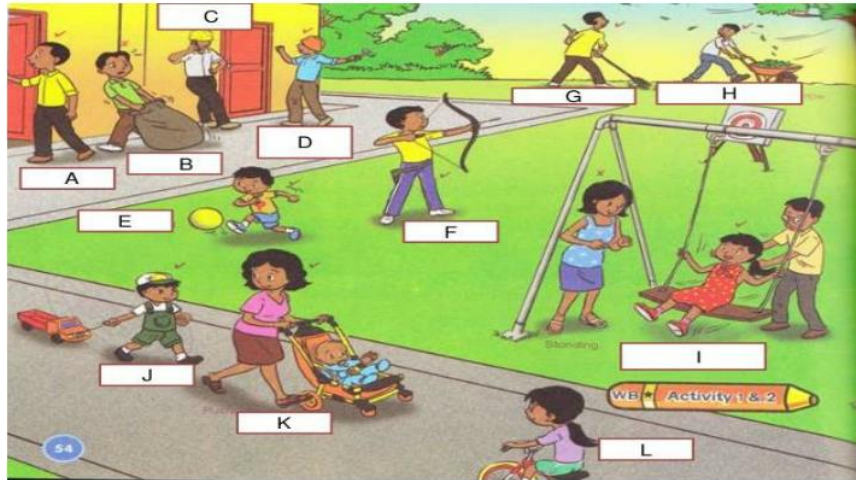
5. Kicking a soccer ball is an example of a:

- a. Push Force
- b. Pull Force
- c. Gravitational Force

## Identifying Forces Around Us

6. Look at the image on the right. **Circle** if the force shown is a **push or pull**.

- A: Push or Pull?
- E: Push or Pull?
- F: Push or Pull?
- H: Push or Pull?
- J: Push or Pull?
- K: Push or Pull?



7. **Fill in the blanks:** We cannot \_\_\_\_\_ a force, but we can see the \_\_\_\_\_ of a force.

8. Forces can help objects:
- a) Speed up
  - b) Slow down
  - c) Stay in place
  - d) Change shape
  - e) All of the above

9. **Fill in the blank:** All forces are measured in something called \_\_\_\_\_.

10. Watch the 3 videos in this chapter to answer the following questions.

### Video 1: Force and Motion



1. **True or False:** If Mia's kick on the ball was the only force acting upon it, it would keep moving, it would never stop.
  1. True
  2. False
  
2. **True or false:** It's harder to move things with a lot of mass, and also harder to stop them.
  1. True
  2. False
  
3. What friction stopped the ball from rolling?
  1. Friction caused by air resistance

2. Friction caused by the grass
3. Gravity
4. **Fill in the blank:** The more friction there is, the more \_\_\_\_\_ you need to apply.

**Video 2: Swings, Slides and Science**



1. **True or False:** Something that's sitting still will stay still, unless a force makes it move
  - a. True
  - b. False
2. **True or False:** Something that's moving will keep moving, unless a force makes it stop.
  - a. True
  - b. False
3. When you are swinging on a swing set, and you want to stop, what are the forces of friction at play, making you stop?
  - a. Air resistance
  - b. Friction from where the swings chains meet the top of the swing set
  - c. Your feet dragging on the ground
  - d. All of the above

**Video 3: Gravity, Force and Work**



1. **Fill in the blank:** The \_\_\_\_\_ kept the rock from falling to the ground from the force of gravity
2. **True or False:** Anytime anything at all that isn't moving, starts moving, it's because some force acts on it.
  - a. True
  - b. False