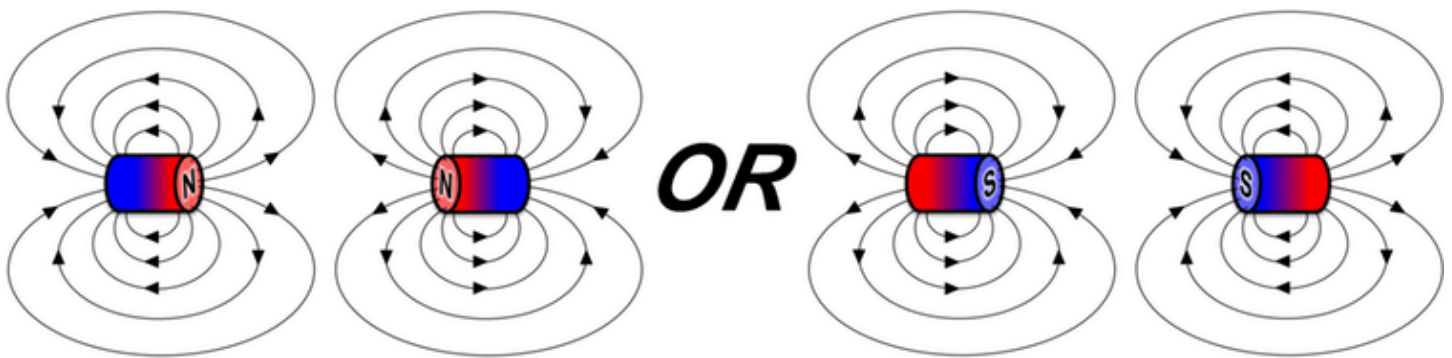


How and Why Do Magnets Stick Together?

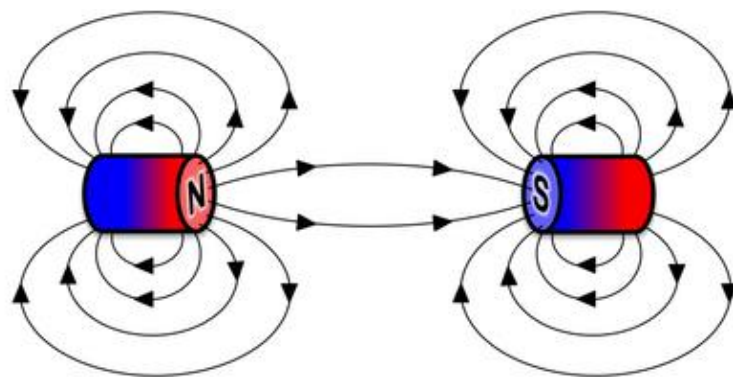
This is an article from [Curious Kids](#).

Every magnet has two sides: a north pole and a south pole, but magnets don't always stick together.

If you hold two magnets the *wrong* way around, they push apart - they repel! In other words, if you hold two magnets together so that like-poles are close together (two norths OR two souths), they repel. It feels like the magnets are surrounded by an invisible rubber layer pushing them apart. That invisible layer is called a magnetic field.



It's only when you hold unlike-poles together (a north pointing to a south) that magnets stick together (they are attracted). Now, the magnetic field acts like a stretched rubber band pulling the magnets together.



Keep reading below....

So, why do magnets attract or repel?

You have probably heard of energy. Energy is needed to create movement.

A car that's sitting still will start to move when the petrol inside it burns. That's because petrol contains stored-up energy which is released when it burns.

When this stored-up energy is released, some of it changes into movement energy. Scientists call this stored-up energy "potential energy" and call movement energy "kinetic energy".

When you start running, it's because energy stored in your food is released and some of it changes into movement energy.

What's this got to do with magnets? Well, the magnetic field that surrounds all magnets contains stored-up energy. But there's a way to change the amount of stored-up energy surrounding the magnet. And the way you change it will tell you which way the magnet will move.

A rule to remember

Everything in the universe follows a rule. I will tell you the rule in a moment, but first I have to say that it's not easy to explain *why* the universe follows this rule without complicated mathematics. The best I can say is "that's just how the universe behaves". (I'm sorry. I don't like answers like that either).

The rule is: wherever there is stored-up energy in an object (and the object is not tied down or stuck in place), then the object will be pushed in the direction that causes the stored-up energy to decrease. The stored-up energy will be reduced and replaced by movement energy.

So, if two magnets are pointing with unlike-poles together (north pole to a south pole), then bringing them closer together *decreases* the energy stored up in the magnetic field. They will be pushed in the direction that decreases the amount of stored-up energy. That is, they are forced together (this is called attraction).

If two magnets are pointing with like-poles together (a south pole to a south pole OR north to north), then stored-up energy will decrease if they move apart.

So, our rule says the magnets will be pushed in the direction that decreases the amount of stored-up energy. That is, they are forced apart (repelled).

I should also say that when dropped objects are attracted to Earth and fall down, it's NOT because of magnetism. It's because of *gravity*. Earth is *also* surrounded by a gravitational field which *also* contains stored up energy.

Unlike magnetism, gravity never repels because gravity only points one way. There are no north and south poles for gravity.