Fields

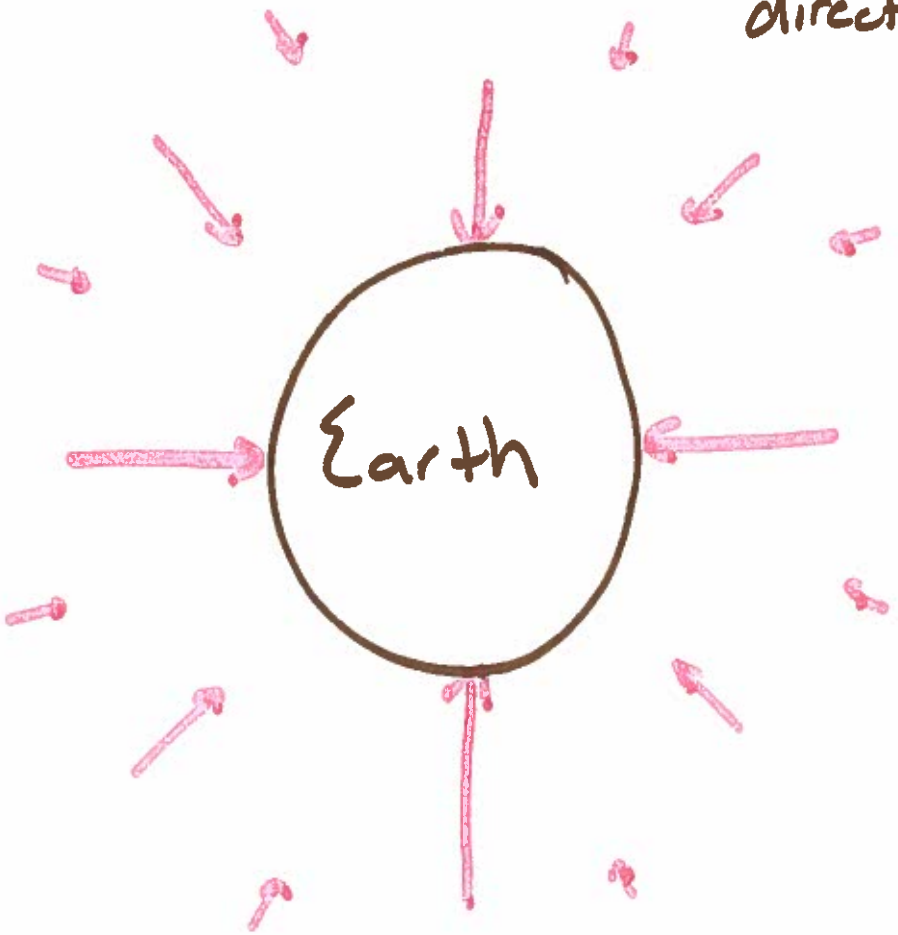
A Field is an invisible force that works at a distance.

Example - Gravity you can't see it but it is always pulling you down.

How to show - Arrows

size → How strong

direction → direction



Charge

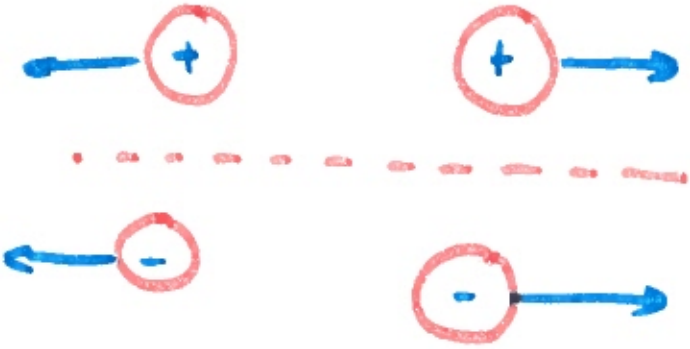
Charge is a single piece of electricity.

There are two types of charge:

Rules of Charge

1) Things are naturally Neutral.
(Neutral means things have equal + and −)

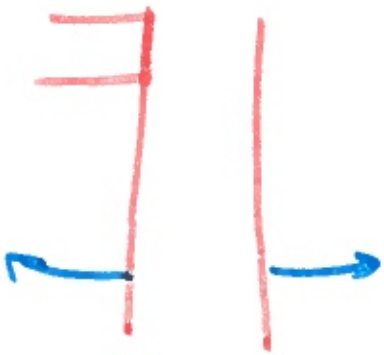
2) Similar charges Repel



3) Oppisate charges Attract

Sticky Tape.

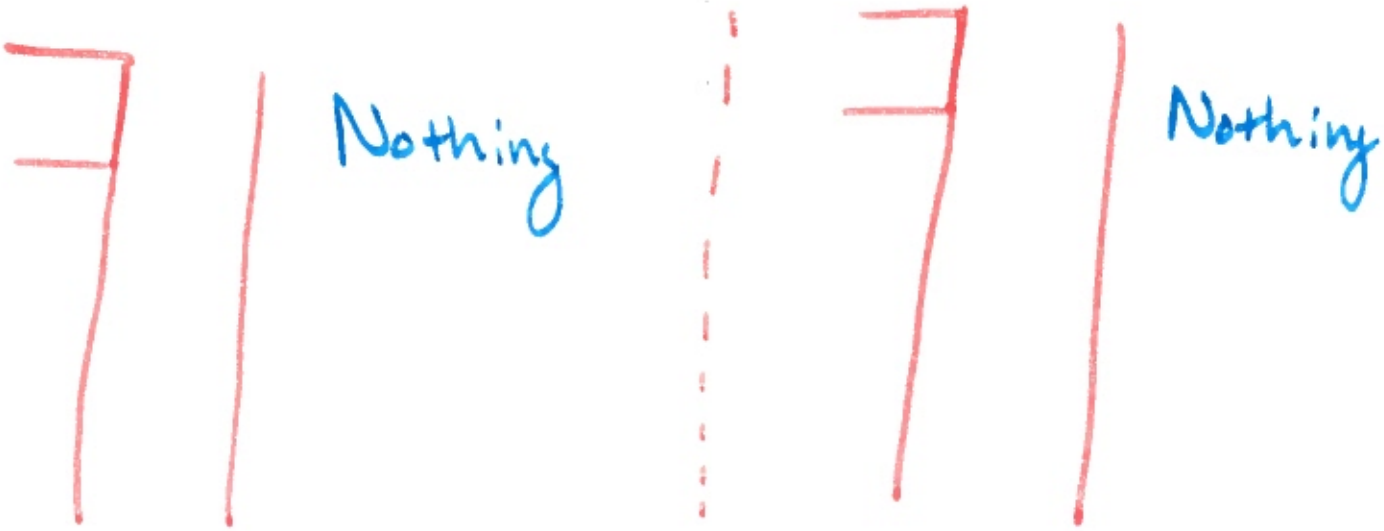
Part A



Because both were made the same way. They have the same charge and repel.

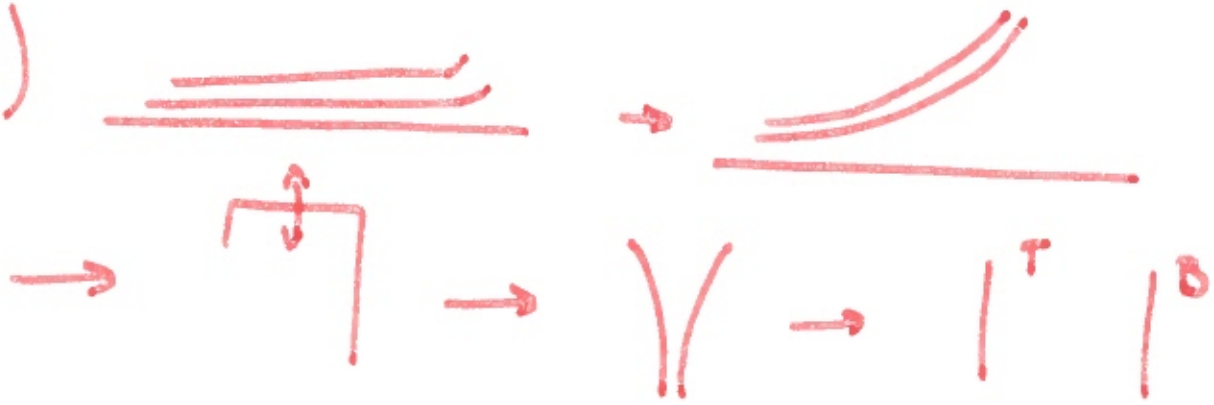
Part B

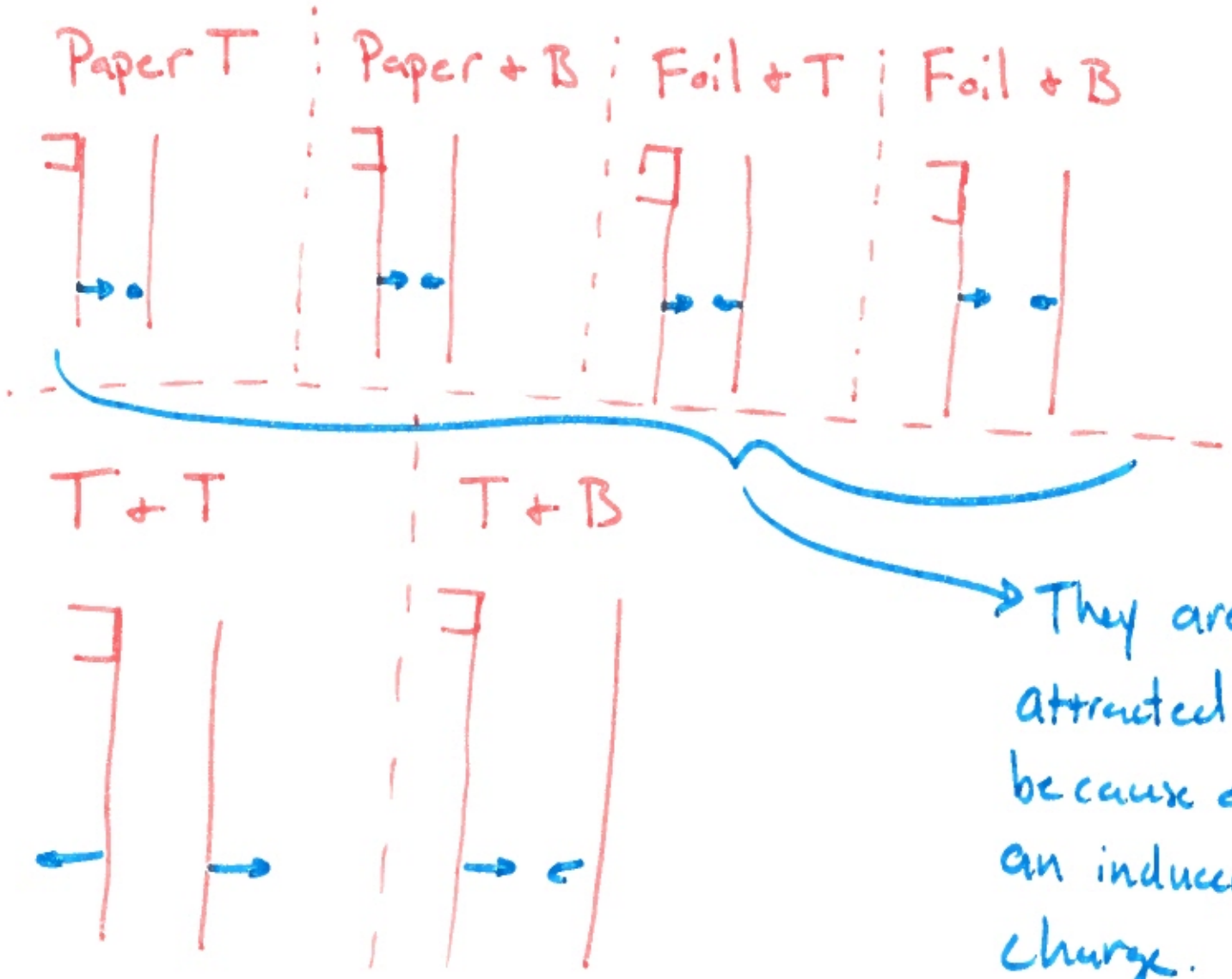
i) Paper + Paper and Foil + Foil



Both are neutral so no force

ii)



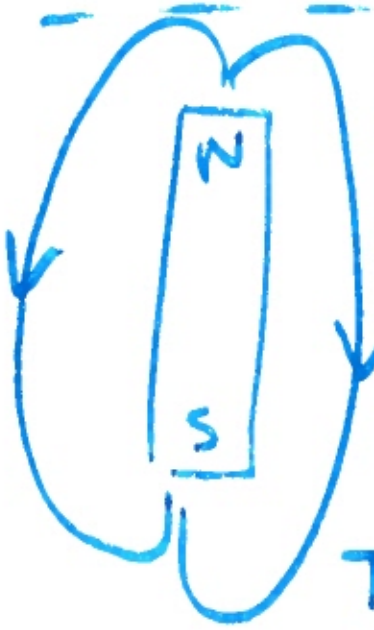


They are attracted because of an induced charge.
See the balloon PHET simulation

Like Repel

Unlike Opposites Attract.

Magnetism Was an activity where You developed a model for magnets.



Magnets have two 'poles'. North & South.

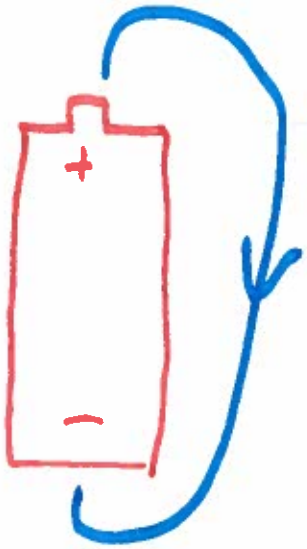
Just like charges, like repel, oppisites attract.

The field lines go from N → S

Current

Current is moving charge.

From + → −.



Conductors - charge can flow

Insulators - charge can NOT flow

But...

Electrons are LOUD! (electrons are what charge is)

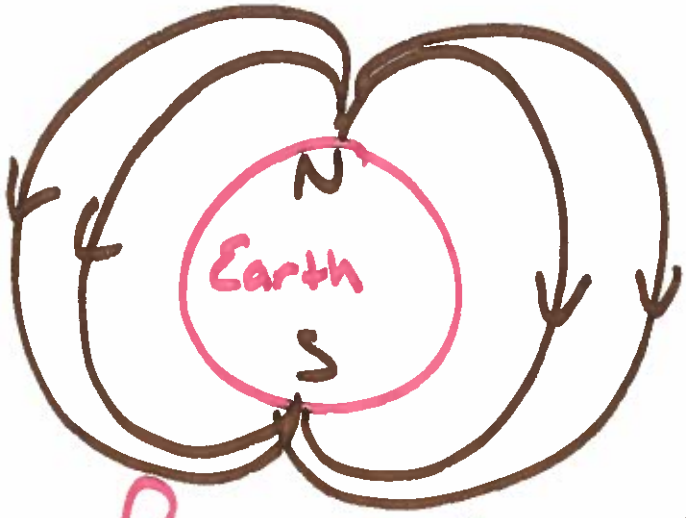
They tell everyone what they are doing.

The 'shout' is a magnetic field.

Magnetism Part II

Magnetism is a Field.

Lines connect from North to South.



Results from Moving Charges

or

Current.

The analogy → An Argument

In a shouting match, ~~each~~ everyone thinks they are right

My Side	Your side
I <u>think</u> I'm right, that is an 'electric field'	You <u>think</u> you're right, that is an 'electric field'
I <u>think</u> you're wrong, that is a 'magnetic field'	You think I'm wrong, that is an '~~electric~~ magnetic field'.

Current, Magnetism, + Forces oh my

A wire, with a current, in a magnetic field, feels a force. The tricky bit is which way...

Explaination

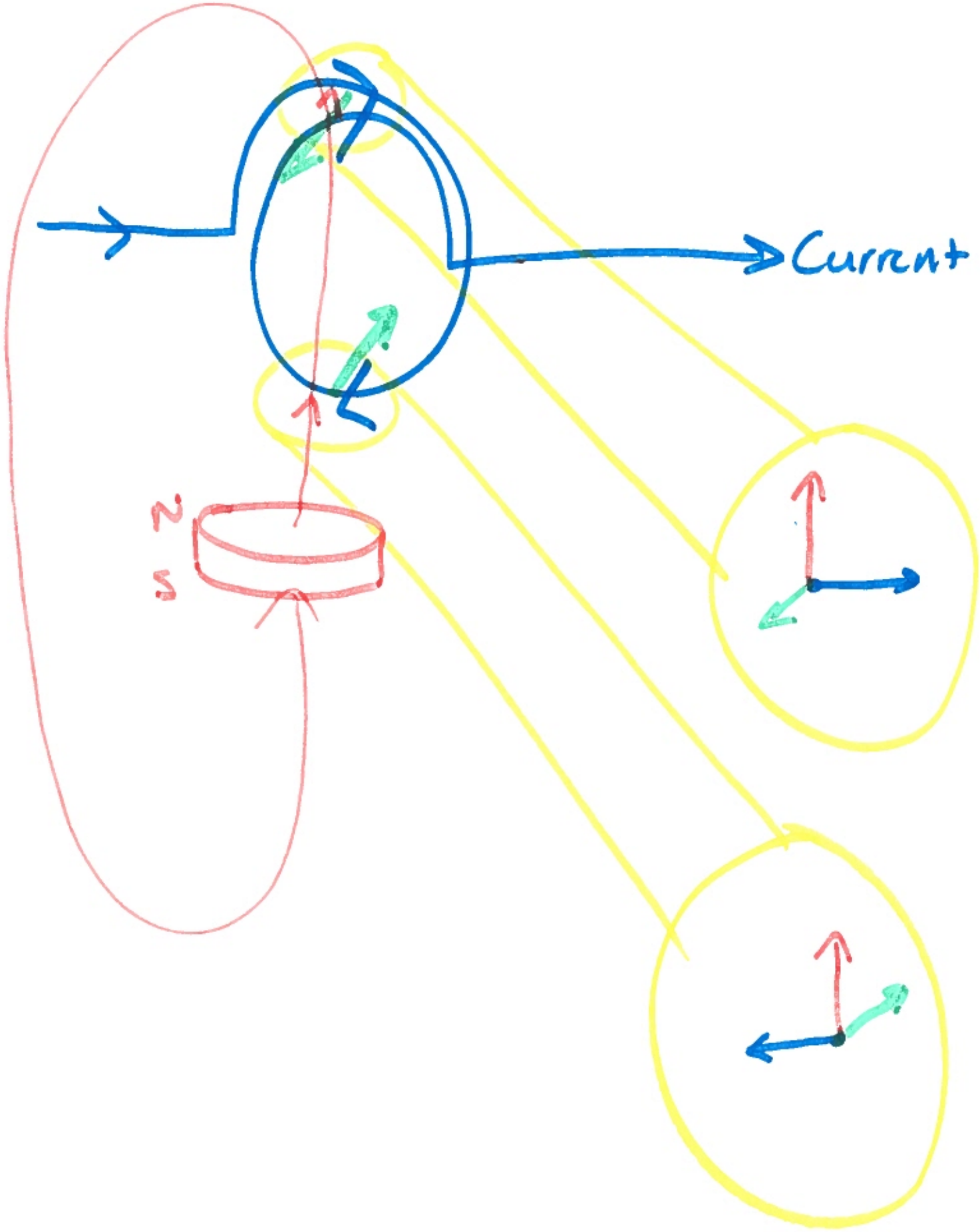
The Current + Magnetic Field + Force form the corner of a cube.

Right hand rule

current is your Pointer finger

Magnetic field is your middle finger

force is your thumb


Current
N
S