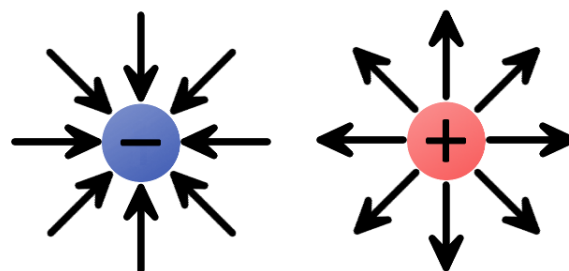





Unit 2: Electricity and Magnetism

Lesson 1: Electricity and designing solutions

- All matter is made of small, tiny **particles**.
- Particles have either **positive charges** or **negative charges**
- **Electrical charges**: the property of matter that causes electricity
- A discharge (removing of charges) occurs when static electricity moves from one object to another



An object with a positive charge and an object with a negative charge attract.	
Objects that both have a positive charge push each other away.	
Objects that both have a negative charge also push each other away.	

- All objects are made of charged particles
- When the positive and negative charges are equal the object is **electrically neutral** (charges are balanced)
- **Negative charges** can move from one object to another, when the two objects touch each other
- **Static electricity**: buildup of electric charges on the object
- **Electric current**: A flow of electric charges in a wire
- **Electric current**: is used in our daily life, it's used to power lights, radios computers and many home appliances
- **Thomas Edison**: An American scientist, he improved the design of electric light bulbs



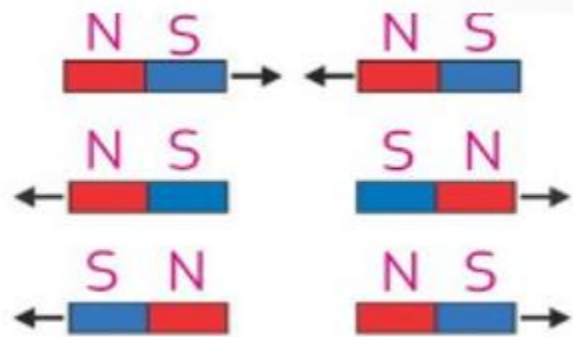
Lesson 2: Magnetism and designing solution

- A magnet: is made of material that can attract objects made of **iron, steel, cobalt & nickel**
- Magnetism: the ability of an object to push or pull another object
- Magnets are made of different shapes and sizes
- Magnets have **2 poles** one is **north pole(N)** and the other is **south pole(S)**.
- Pole: is one of the two ends of magnet.
- **The pole of the magnet has the strongest attraction force**

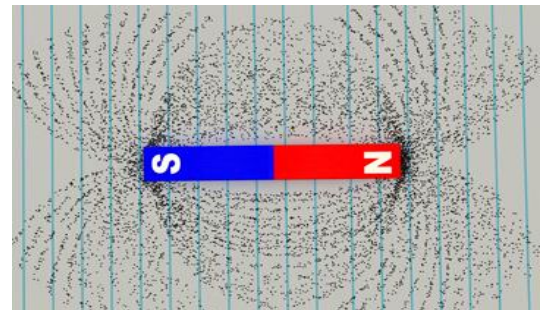
Two magnets attract each other when the south pole of one faces the north pole of the other.

Two magnets repel each other when their south poles face each other.

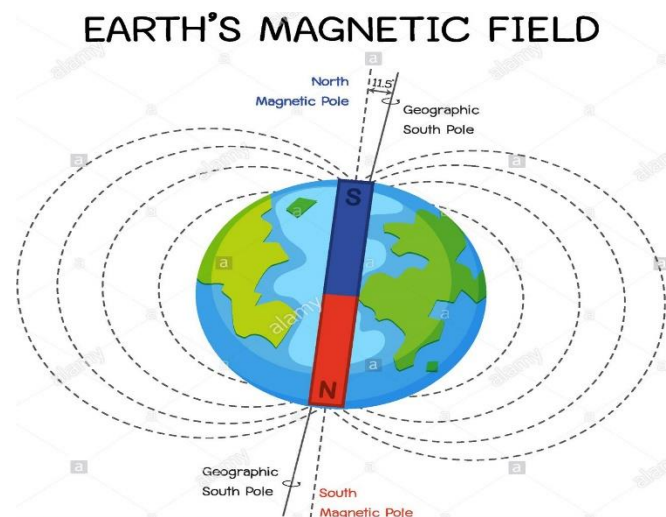
Two magnets also repel each other when their north poles face each other.



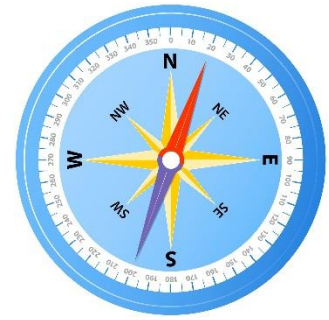
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- **Magnetic field**: is the Area around the magnet where its force can attract or repel
- We cannot see magnetic field, but we can feel where it is



- **Earth's Magnetic field**: the Earth is Like a huge magnet it has magnetic field due to the huge iron deep in its core and it has two magnetic poles.



- **A compass:** is a tool that helps you to find the directions (north, south, east, and west)
- The needle of the compass is magnet



- **Magnetic field can be produces from electric current**
- If you wind a coil around a piece of iron and connect a battery, the piece of iron will be a temporary magnet (Electromagnet)

➤ **Electromagnet is stronger when:**

- i) Increase number of batteries
 - ii) Increase number of coil turns
- Electromagnets are used in many appliances as speakers and doorbell



- **Dynamo:** is a simple tool that changes **motion energy** into **electricity** in the presence of a magnet that spins inside a coil of wire

Best wishes my dear students

Ms. Samar Madian