SNC 1D Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit: Electricity

**Electrical Discharge**

When two objects that have a charge imbalance are brought close together or touch, electrons are transferred from the negatively charged object to the positively charged object.

We call this fast movement of extra electrons an electrical discharge (spark).

For example, you can feel the electrical discharge when you touch someone after building up static electricity by rubbing your feet against the carpet. You can also sometimes feel this when you touch a door handle or light switch. The most dramatic electrical discharge is lightning.

**Lightning**

1. Static electricity builds up in clouds as water (ice crystals, ice chunks etc) particles rub together.
2. Electrons tend to move to the bottom of the cloud, leaving the rest of the cloud with a positive charge
3. The electrons in the cloud repel the electrons in the ground, so they move away from the cloud.

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* + The surface of the ground is now positive. This is charging by induction.

1. Particles of air between the cloud and the ground lose electrons because they are repelled by the negative bottom of the cloud. So, the air particles become positively charged.
2. When a chain of positive air ions forms, electrons are attracted all the way down to the ground and move there all at once, called lightning, before they spread out into the ground.

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Lightning is very hot and fast and creates a sonic boom: thunder

3 seconds between lightning bolt and sound of thunder = 1 km away

5 seconds between lightning bolt and sound of thunder = 1 mile away

**Lightning Rods**

* Lightning tends to take the fastest path to the ground by striking the tallest object.
* Lightning rods are placed at the highest point possible and are connected to the ground.
* The point is to allow electrons to flow through them and carry the charge into the ground.
* This is why they are generally made of metal, materials that are good conductors.