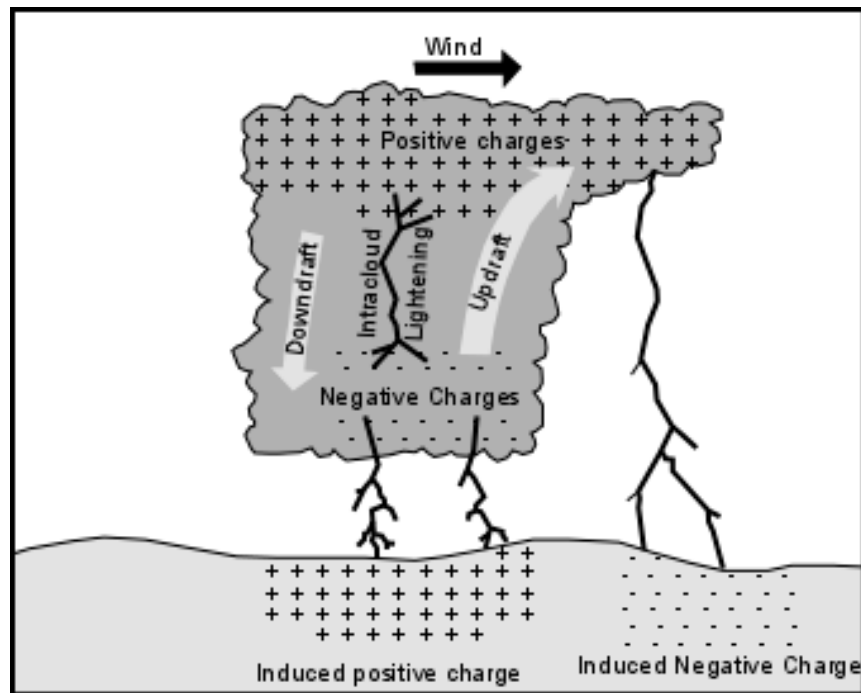
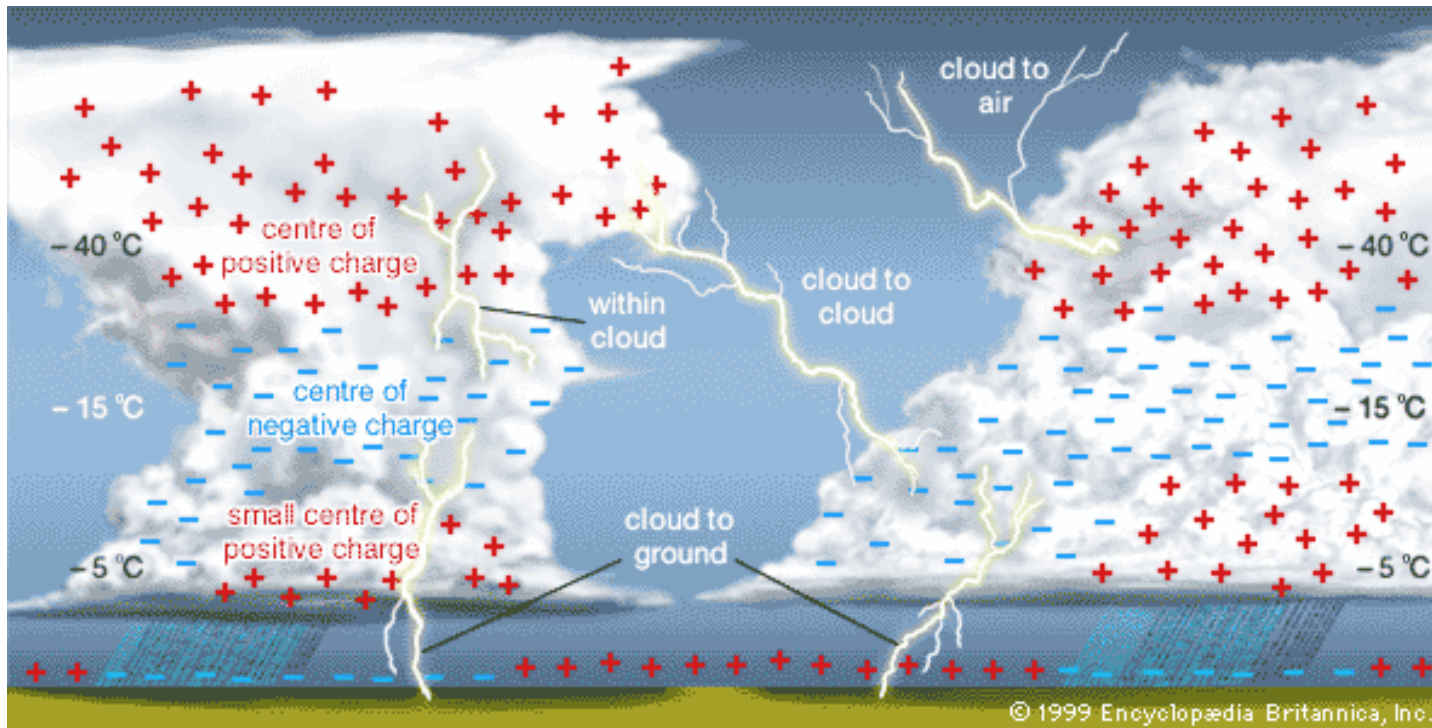


Static Electricity in Everyday Life

S1-03-06 Investigate common electrostatic technologies and phenomena and describe ways to reduce dangers associated with electrostatics.

Lightning:

- The **FRICTION** of the clouds rubbing together causes the **BOTTOM** of a cloud to become **NEGATIVELY CHARGED**, and the **TOP** to become **POSITIVELY CHARGED**
- The charge becomes **VERY LARGE** and it **INDUCES** an **OPPOSITE (+VE)** charge on the **GROUND**.
- As the charge gets larger and larger, the **ELECTRONS** at the **BOTTOM** of the cloud **REPEL** each other more and more until they finally **DISCHARGE**
→ **LIGHTNING!**
- The **OPPOSITE** can also happen (**ELECTRONS DISCHARGE** from the **GROUND** to the **CLOUDS**)



The Nature of electricity...

- When the clouds become charged, this is **STATIC ELECTRICITY**.
- Once the electrons **DISCHARGE (LIGHTNING)**, the static electricity becomes **CURRENT ELECTRICITY**.
- Electricity is **LAZY**, it always takes the **SHORTEST** and **EASIEST** path, and the path usually leads to the "**GROUND**".

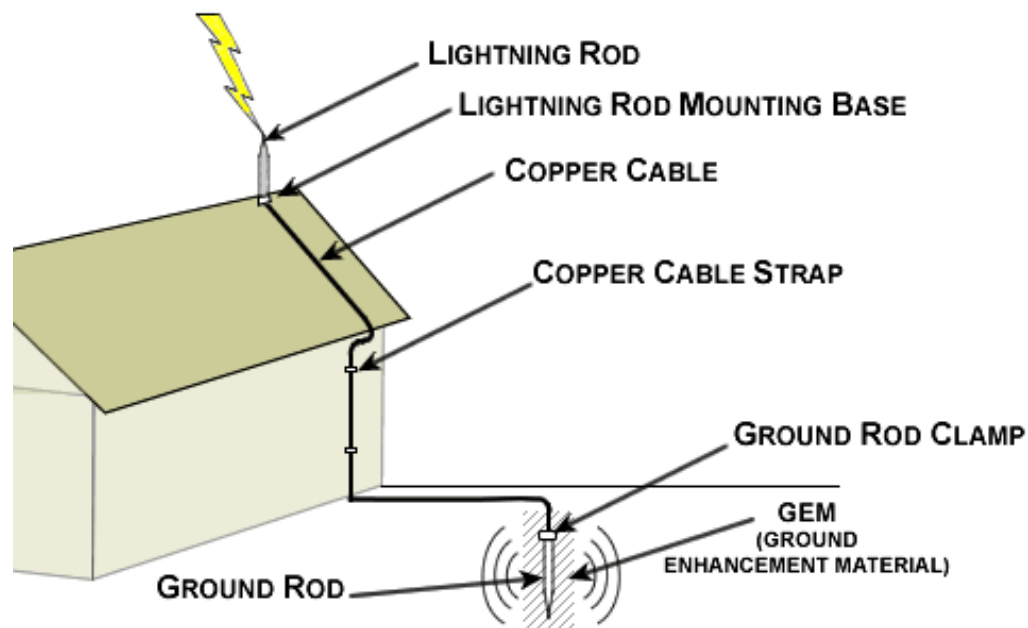
Usually the easiest route to the ground is the **TALLEST** point. So if you stand in the middle of a field, you become the **QUICKEST** path to the **GROUND**, and the lightning is more likely to hit you.



Lightning Rods

Sometimes **BUILDINGS** are the quickest route to **GROUND**. This is why many buildings have **LIGHTNING RODS**.

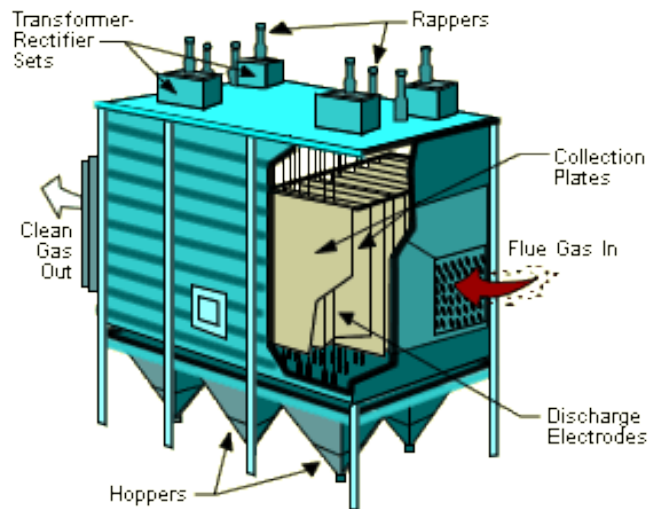
A lightning rod is a **METAL (CONDUCTOR)** rod that is attached to the **ROOF** of a house so that it is the **TALLEST** point on the house. A **COPPER WIRE** is run from the **ROD** down into the **GROUND**, making a **SAFE** path for lightning to travel.



Uses of Static Electricity

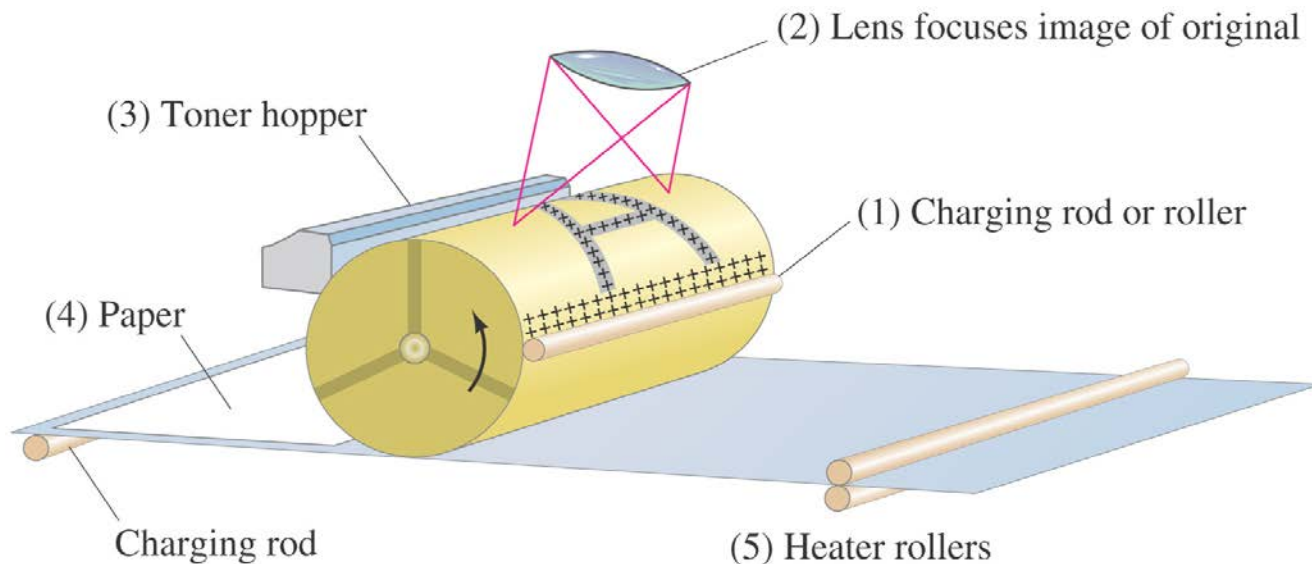
1. Electrostatic Precipitators:

- A **PRECIPITATOR** is a device that uses **STATIC** charge to remove unwanted **PARTICLES** out of the **AIR**.
- It has **HANGING** charged **RODS** that attract the **NEUTRAL PARTICLES** from the **AIR**. They **STICK** to the rods, and are then **CLEANED** off.
- These are seen all throughout **INDUSTRY**, and are used to reduce air **POLLUTION**.



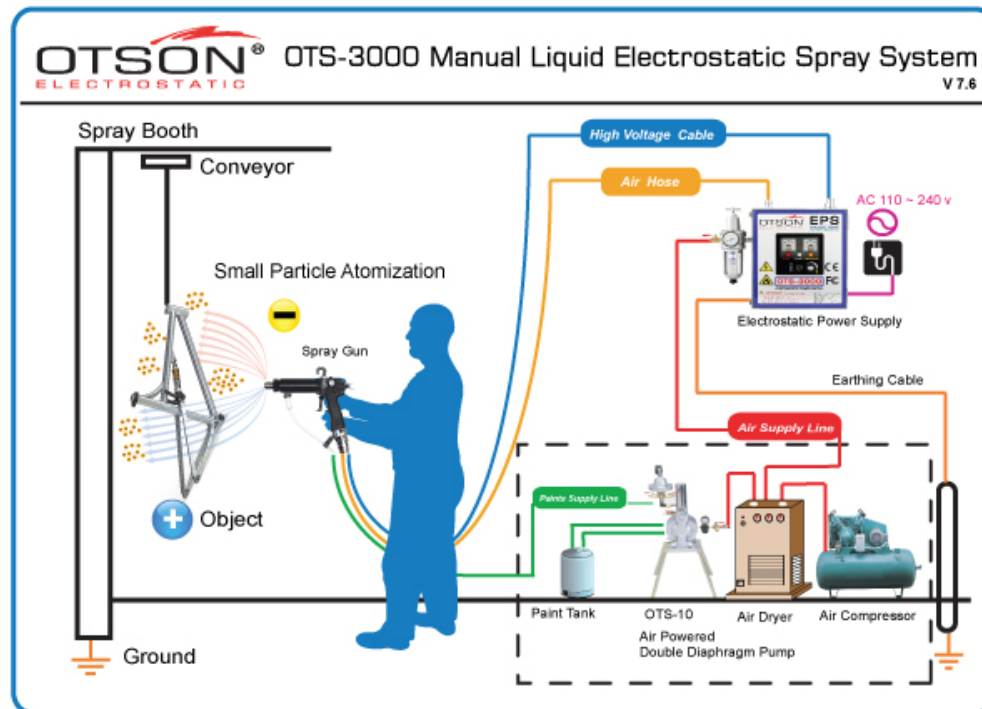
2. Photocopiers:

- A photocopier works solely on the principles of static electricity.
- LIGHT is reflected off of the image to be copied onto a SELENIUM coated DRUM, giving the DRUM a POSITIVE charge wherever the LIGHT HITS.
- NEGATIVELY charged "TONER" is sprinkled on the drum, and sticks to the areas that are CHARGED.
- A POSITIVELY charged piece of PAPER is brought over the drum, and the TONER is TRANSFERRED to the paper.
- The paper is HEATED and the toner FUSES to the paper.



3. Electrostatic Spraypainting:

- Static electricity is also used to PAINT different objects like CARS, TOOLS, BOATS, etc.
- The object to be painted is given a STATIC CHARGE so that it will ATTRACT the PAINT that is being sprayed.
- The result is a much BETTER and more EVEN paint FINISH on the object. (no area is missed)



4. Fabric Softener Sheets:

- When clothes dry in a dryer, they **RUB** together, creating **STATIC CHARGE**.
- When sheets of fabric softener tumble with the clothes, they act as **CONDUCTORS**, allowing **ELECTRONS** to move around the clothes more easily.
- The **MOLECULES** of the **SOFTENER** are **TRANSFERRED** to the fabrics, making them **FEEL** more like one another (so they won't **TRANSFER ELECTRONS**)



Negative Effects of Static Electricity...

Static electricity can be both annoying and dangerous. Think of some examples and write them below:

1. When is Static Electricity Annoying?

2. When is Static Electricity Dangerous?