

When the Lightning Strikes: Static Electricity



<https://www.youtube.com/watch?v=m37z5R2rJ5E>

1. What would happen if an unprotected aircraft were to be struck by lightning?

- The area struck would heat up and burn, melt or break
- The electrical components of the plane could get burnt out and stop working
- There's a chance that the fuel could be ignited and start a fire

2. Why is the lightning drawn to the airplane specifically?

The airplane is of a more conductive material (a metal) and represents an “easier” path for the electrons to travel through compared to the air.

Remember “Short, Fat, Cold, Copper”? The airplane is made of aluminum (not as conductive as copper, but better than the air around it).

3. Lightning strikes dozens of times every second and involves incredible amounts of energy. However, very similar events happen on much smaller scales such as the shock you might get while wearing wool clothing. What is the scientific term for these shocks?

-Static Electricity

OR

-Electrostatic Discharge

4. Most lightning occurs when a negatively charged cloud passes close to the ground and makes the surface positively charged. What is this process called?

Electrostatic Induction

The negative charges (electrons) in the ground get pushed away by the negatively charged cloud. This makes the surface of the ground positive and causes an attractive force between the ground surface and the electrons in the cloud.

5. Another way to charge an object or material is through friction. Describe how the rods in each of the following situations will interact if brought close together (attract or repel)
- a) A plastic rod rubbed with cotton cloth and a lead rod rubbed with a silk cloth.

Attraction (Lead +, Plastic -)

- b) A gold rod rubbed with plastic wrap and a rubber rod rubbed with wool.

Attraction (Gold +, Rubber -)

- c) A lead rod rubbed with a silk cloth and a glass rod rubbed with paper.

Repulsion (Lead +, Glass +)

Tendency	Substance
High affinity to capture electrons (Take on Negative charge)	<ul style="list-style-type: none">• Plastic• Sulphur• Gold• Nickel• Rubber• Amber• Cotton• Paper• Silk
Strong tendency to give electrons (Take on Positive charge)	<ul style="list-style-type: none">• Lead• Wool• Glass