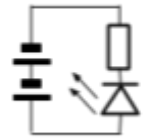


Moving Charge

Space School



- 1) Fill in the blank spaces with the correct word from the word bank. The first letter of the word is given.

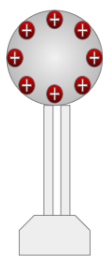
When s_____charges move off an object which is an insulator we say that the object has been d_____. These discharges involve the movement of e_____. The charges are now moving. Moving charges are called an electric c_____.

- 2) What causes an electric spark?



- 3) Describe how walking across certain carpet material causes a buildup of charge on your body that can give you a small electric shock if you touch something made of metal.

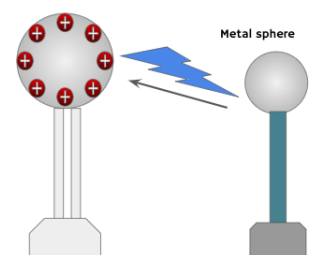
- 4) Copy the diagram of the Van de Graaff generator which is positively charged. Sketch the electric field which surrounds the positively charged dome.



- 5) When a metal sphere is brought near a positively charged dome of a Van de Graaff generator a spark is produced.

Copy and complete the missing words (*check the word bank for question 5*).

The electric f_____ is so strong between the Van de Graaff d_____ and the metal sphere that the air in between is i_____ and provides a conducting p_____ for electrons to be pulled from the metal sphere onto the positive dome. The dome then becomes d_____. The sudden m_____ of electrons causes the spark



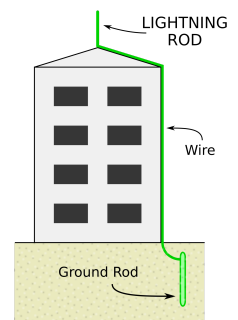
6) The quantity of charge on an electron is 1.6×10^{-19} C. Determine how many electrons make up one full coulomb of charge.

7) In the table below determine the missing value of charge, current or time:

<p>(a)</p> <p>A Van de Graaff generator dome has a electric charge of 2.3×10^{-6} C. It is discharged in a time of 0.2 s.</p> <p>Determine the average current in the discharge.</p>	<p>(b)</p> <p>A lightning flash is estimated to have a charge of 60 C. The lightning flash takes 0.03 s to discharge the cloud.</p> <p>Determine the average current in the discharge.</p>	<p>(c)</p> <p>It is estimated that there is a charge of 6×10^{-6} C stored in the hand of a technician. If the average discharge current is 0.000 3 A then find the time of the discharge</p>
<p>(d)</p> <p>During an electric discharge an average current of 4.0 A flows for a time of 0.005 s.</p> <p>Determine the amount of electric charge that flowed.</p>	<p>(e)</p> <p>An electric discharge happens in a time of 0.002 s. It is estimated that there is an average current of 4 A during the discharge.</p> <p>Determine the amount of charge that flowed.</p>	<p>(f)</p> <p>Find the average current that flows when 30 coulombs of charge flows in a spark in 0.5s</p>

8) Lightning rods are tall spikes on the top of buildings which run down the side of the building into the ground.

Describe how a lightning rod prevents lightning from damaging a tall building out in the open.



9) Why should you never shelter under a tree in a thunderstorm?

10) Why is it safe to be in a car or an aircraft during a thunderstorm?
State and explain which effect makes it safe.

Word Bank question 1

1. static
2. current
3. electrons
4. discharged

Word Bank question 5

1. ionised
2. dome
3. discharged
4. movement
5. path
6. field

Answers to numerical questions:

6. 6.25×10^{18} electrons
7. (a) 1.15×10^{-5} A (b) 2000 A (c) 0.02 s (d) 0.02 C (e) 0.008 C (f) 60 A