

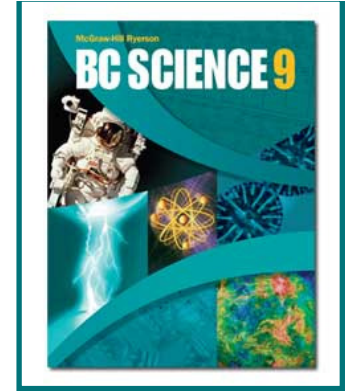
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- **for students to copy in their own hand-writing**
 - **in order to complete their class notes**
 - **if student did not have enough time in class**
 - **if student was away and missed this section**
- **for assistants and tutors to follow progress of the concepts taught**

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7.1 Static Charge

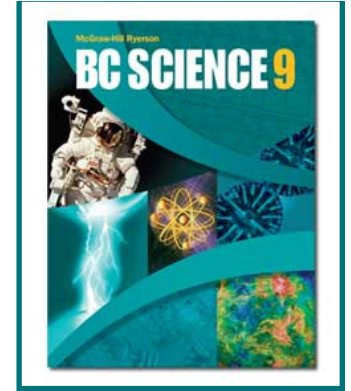


- Electrical charge that is collected in one place
- Static charge is often encountered in everyday life when objects rub against one another and transfer charge

Positive and Negative Charges

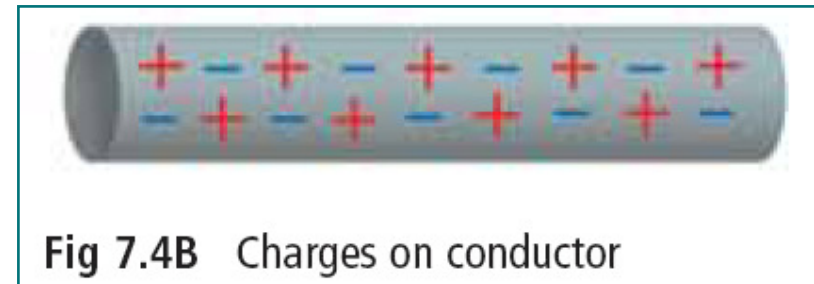
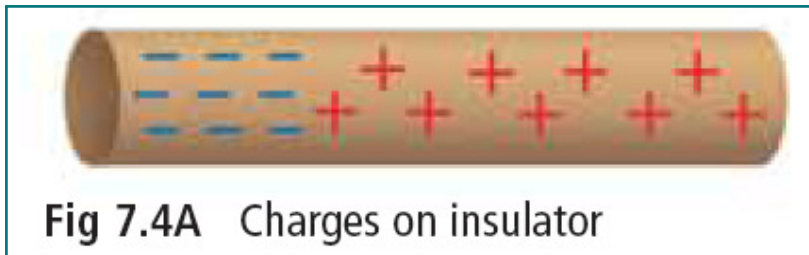
- All matter is made of atoms - at their centre is a nucleus containing protons (positively charged) and neutrons (no charge). Surrounding the nucleus are electrons (negatively charged)
- Solid materials are charged due to the movement of electrons - when electrons are gained, the object becomes negative. When electrons are lost, the object becomes positive.
- Electrons are most often transferred through friction, when objects rub against each other.

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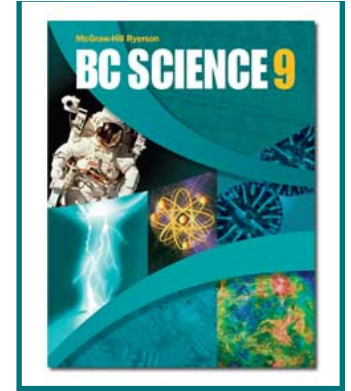
7.1 Insulators and Conductors

- Materials that do not allow charges to move easily are called electrical insulators
- Materials that allow electrons to travel freely are called electrical conductors
- Only insulators are good at retaining static charge



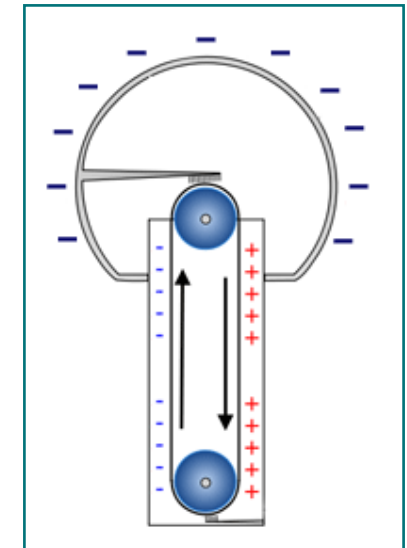
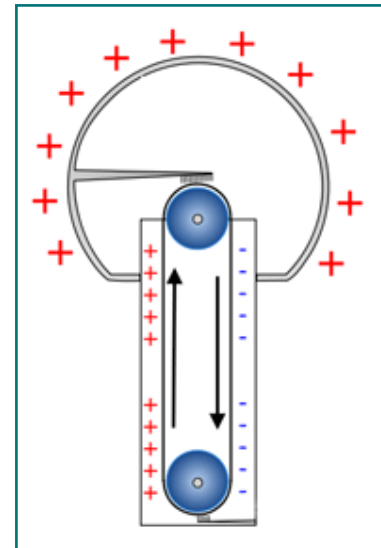
- Charge is measured with a unit called the coulomb (C)

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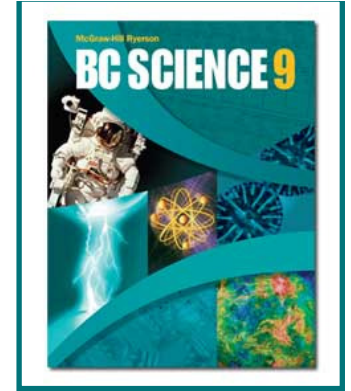


7.1 Generating Static Charge

- Van de Graaff generators (VDG) use friction to produce large amounts of static charge.
- As a rapidly moving belt moves over rollers, contact between the two results in a transfer of charge.
- A moving belt produces static charge on a metal dome - the charge resulting on the dome depends on the materials used in the VDG belt and rollers.



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7.1 Applications and Dangers

- Static charge can be very useful - electrostatic filters can be used to clean air, paint automobiles, and hold objects with electrostatic attraction.
- Static charge can also be dangerous - when it builds up it can discharge and cause serious shocks, explosions or fires. Those pumping flammables must ensure objects are grounded (connected to the Earth so that static charge is discharged).
- Lightning is especially dangerous - buildings can be protected with lightning rods.



Take the Section 7.1 Quiz

See pages 253 - 254