

# SNC1D PHYSICS

## THE CHARACTERISTICS OF ELECTRICITY

☛ Charging by Contact  
(P.407)

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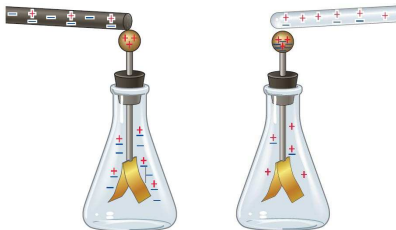
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### Charging by Contact

*As you learned earlier one method of charging a neutral object is through friction. Several other methods of charging include contact (conduction) and induction.*



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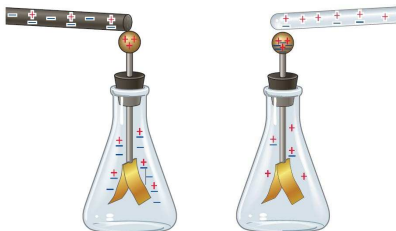
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### Charging by Contact

**Charging by contact** occurs when a charged object and a neutral object come in contact and electrons move from one object to the other until there is a balanced distribution of charge between the two. As a result, both objects end up with the same charge.



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### Charging by Contact

For example, if a negatively charged bar touches a neutral sphere, some of the excess electrons on the charged bar which are repelling each other, move onto the sphere until there is a balanced distribution of charge between the two objects. As a result, the sphere becomes negatively charged as well.



bar =  $\bar{-}$   
sphere =  $\bar{neutral}$

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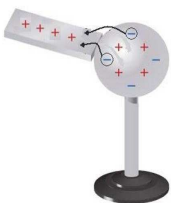
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### Charging by Contact

And the opposite occurs if you touch a positively charged rod to a neutral sphere. Some of the electrons on the sphere will be attracted more strongly to the positively charged rod and move from the sphere to the rod until there is a balanced distribution of charge between the two objects. As a result, the sphere becomes positively charged as well.



bar =  $\bar{+}$   
sphere =  $\bar{neutral}$

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### Charging by Contact

**CHARGING BY CONTACT**

- ❖ occurs when two objects with different amounts of electric charge come in contact
- ❖ electrons move from one object to the other until there is a balanced distribution of charge
- ❖ both objects end up with the same charge

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### Charging by Contact

*Charging by contact, however, does not always involve a charged object and a neutral object. Two charged objects may come in contact, and electrons may move from one object to the other.*

metal rod X (overall +2 charge)      metal rod Y (overall +2 charge)

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### Charging by Contact

**NOTE!**  
*Electrons always move from the object with the larger negative charge (i.e. less positive) to the object with the smaller negative charge (i.e. more positive). This produces a more even distribution of electric charge between the two objects.*

metal rod X (gaining an electron)      metal rod Y (losing an electron)

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### ✓ Check Your Learning

1. Explain with the aid of a diagram(s) what will happen when:  
(a) a positively charged object touches a neutral object.

(a) electrons move from the neutral object onto the positively charged object until the charge is balanced

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 **Check Your Learning**

1. Explain with the aid of a diagram(s) what will happen when:  
(b) a negatively charged object touches a neutral object.

(b) electrons move from the negatively charged object onto the neutral object until the charge is balanced

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 **Check Your Learning**

2. A rod, "X," has a positive charge of 8. An otherwise identical rod, "Y," has a negative charge of 4. The rods are touched together and then separated.  
(a) When they touched, what particles moved between them?  
(b) Did the particles move from "X" to "Y" or from "Y" to "X"?

(a) electrons  
(b) Y to X

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 **Check Your Learning**

3. Compare charging by contact to charging by friction.

charging by:

- friction – occurs when two different neutral objects are rubbed together
- contact – occurs when two objects with different amounts of electric charge come in contact

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 ✓ Check Your Learning

**WIKI (PHYSICS)**

 1DPHYS - WS2 (Counting Charges)  diagrams 1 to 4 only

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