Chapter 33

Electric Field

Definition: The direction of the force on a **positive** test charge.

The "Line of force" at any point in space shows the direction of the force on a positive test charge. (A negative charge would move in the opposite direction).

Sketch the electric field lines in the vicinity of a positive charge.

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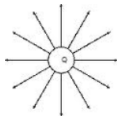

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You have two positive charges separated by empty space. Sketch the electric field in the vicinity of the charges.

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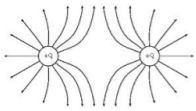

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Sketch the electric field in this area.

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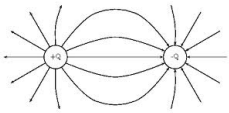

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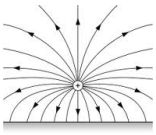

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Let's say I move a charge from one point to another. If I am moving it against an electric field I have to do work.

Potential difference (V)
V = work done/charge moved
V = W/q

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V=W/q
Volt = Joule/Coulomb

1.5 volt battery

This is a 9 Volt battery. Every coulomb of charge moving through the battery gains 9 Joules of energy.

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The standard house outlet in the USA provides about 110 volts.

110 volts can be dangerous!

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This special outlet supplies 220 volts to an electric dryer or electric range.

220 volts can be even more dangerous!

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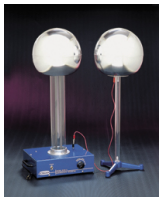

Van de Graaff generator generates very high voltages.

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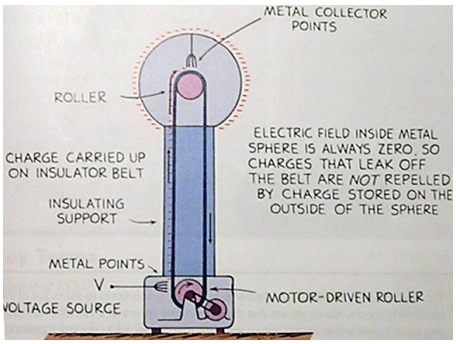

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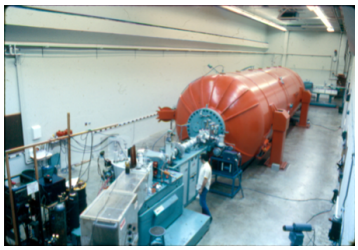
Tandem Van de Graaff accelerator.



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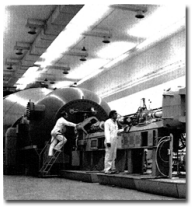

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