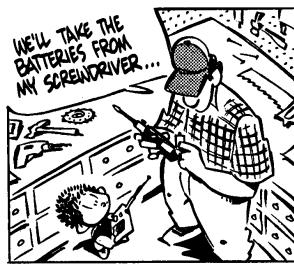


February 27, 2017

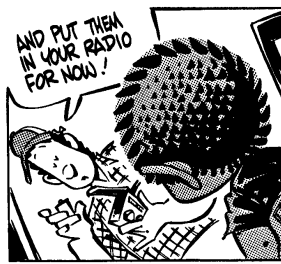
Physics 132

Prof. E. F. Redish

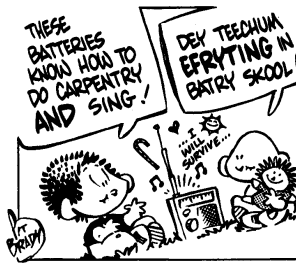
- **Theme Music: The Black-Eyed Peas**
Electric City
- **Cartoon: Pat Brady**
Rose is Rose



2/27/17



Physics 132



1

Outline

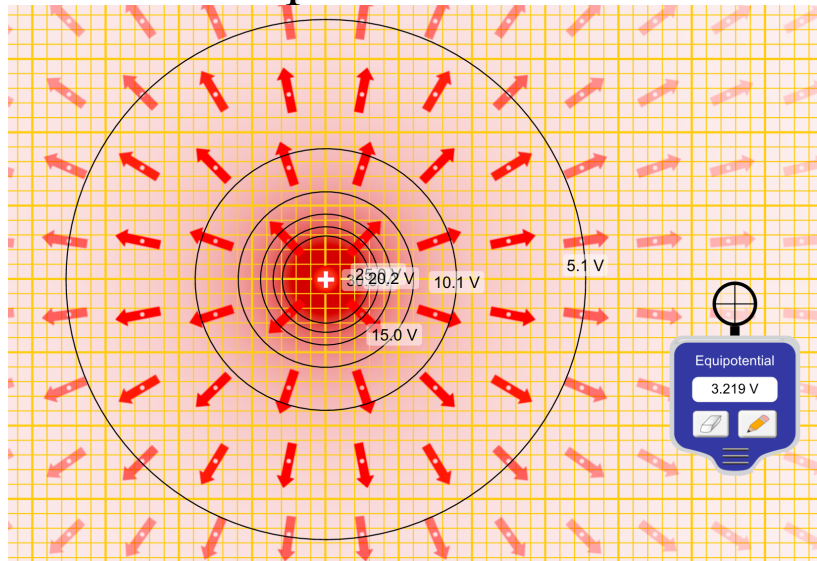
- Quiz 5
- Equipotentials in special cases
- Field of two large parallel plates
- Capacitance
- The field and potential in a capacitor

2/27/17

Physics 132

2

Representations



<https://phet.colorado.edu/en/simulation/charges-and-fields>

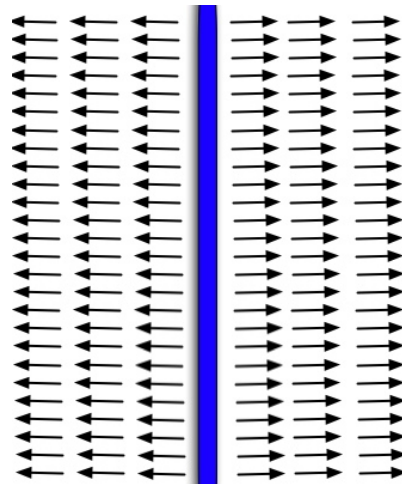
2/27/17

Physics 132

4

The sheet of charge

- Field is constant, pointing away from positive sheet.
- What do the equipotential surfaces look like?

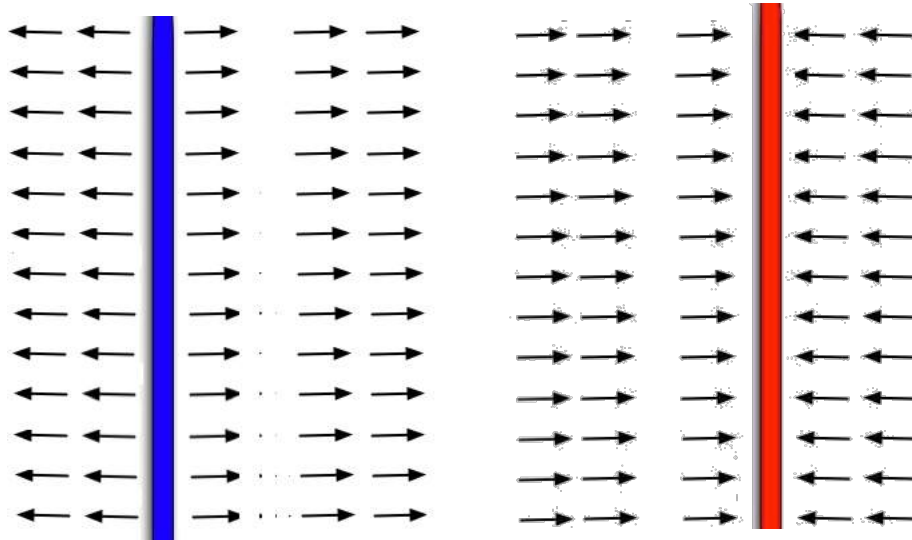


2/27/17

Physics 132

9

Two sheets of charge



2/27/17

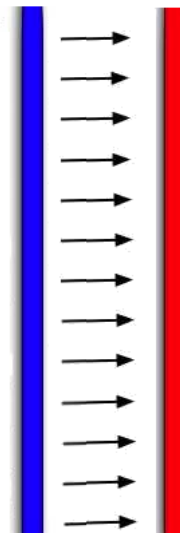
Physics 132

10

Result

The fields of the two plates cancel each other on the outside.

The fields of the two plates add on the inside, producing double the field of a single plate.



The fields of the two plates cancel each other on the outside.

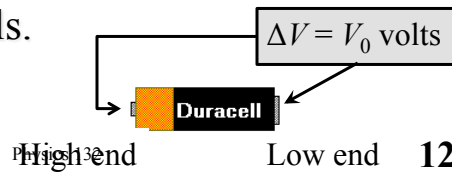
2/27/17

Physics 132

11

Some basic electrical ideas

- **Conductor** – a material that permits some of its charges to move freely within it.
- **Insulator** – a material that permits some of its charges to move a little, but not freely.
- **Battery** – a device that creates and maintains a constant potential difference across its terminals.



2/27/17

12