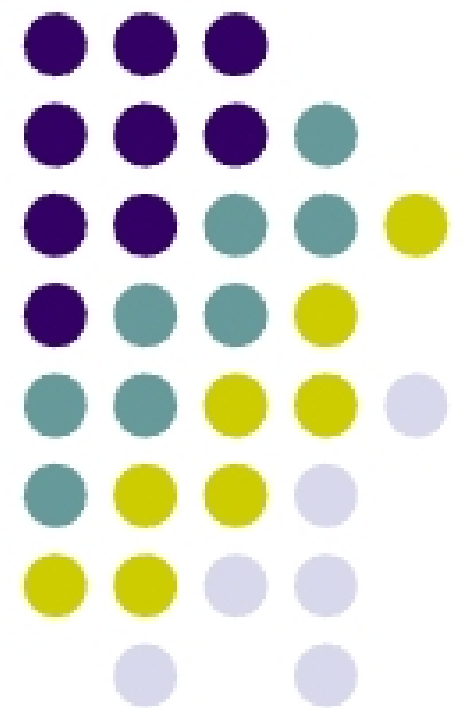


# Chapter 27

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Current  
Resistance  
And  
Resistor



# Electric Current, the definition

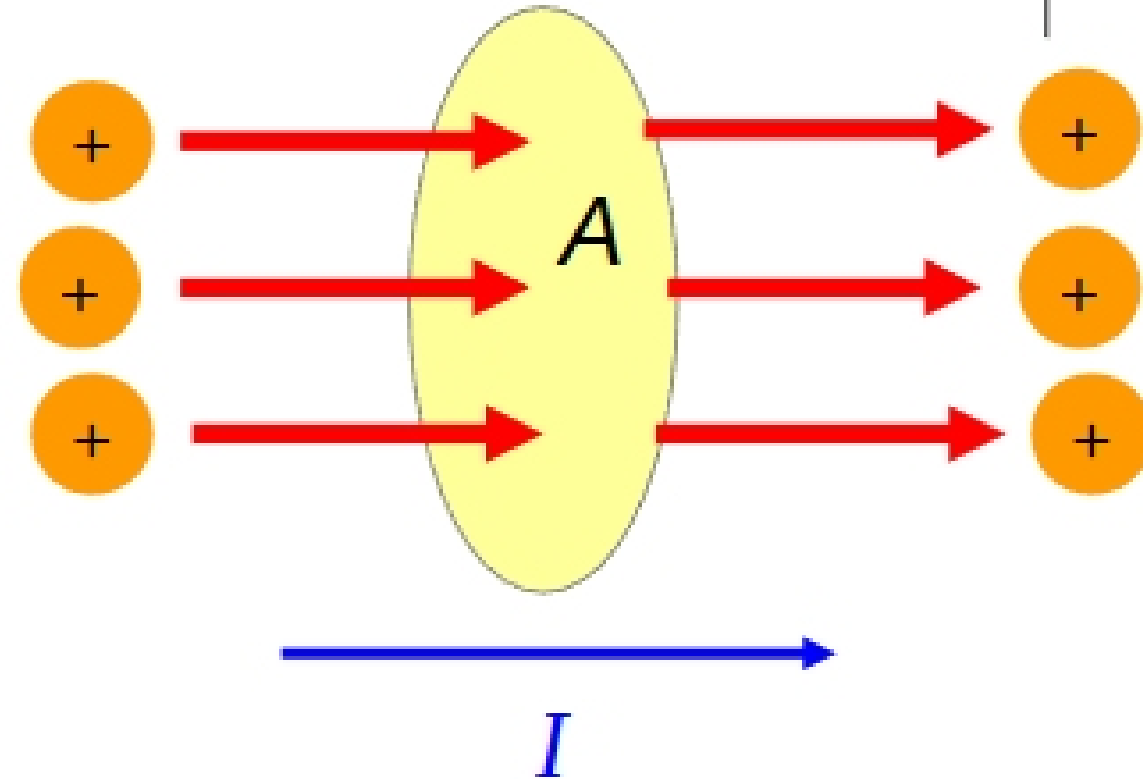


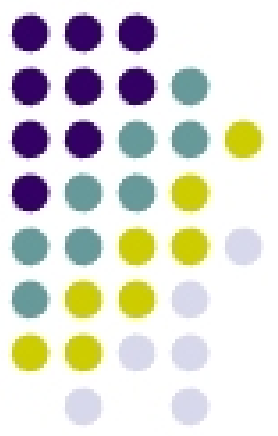
- Assume charges are moving perpendicular to a surface of area  $A$
- If  $\Delta Q$  is the amount of charge that passes through  $A$  in time  $\Delta t$ , then the average current is

$$I_{avg} = \frac{\Delta Q}{\Delta t}$$

or

$$I = \frac{dQ}{dt}$$





# Electric Current, definition and unit

- **Electric current** is the rate of flow of charge through some region of space
- The SI unit of current is the **ampere (A)**
  - $1 \text{ A} = 1 \text{ C} / \text{s}$
  - And ampere is a base unit. The unit for time, second, is also a base unit.
  - The unit for charge is then defined as  $1 \text{ C} = 1 \text{ A} / 1 \text{ s}$
- The symbol for electric current is  $I$