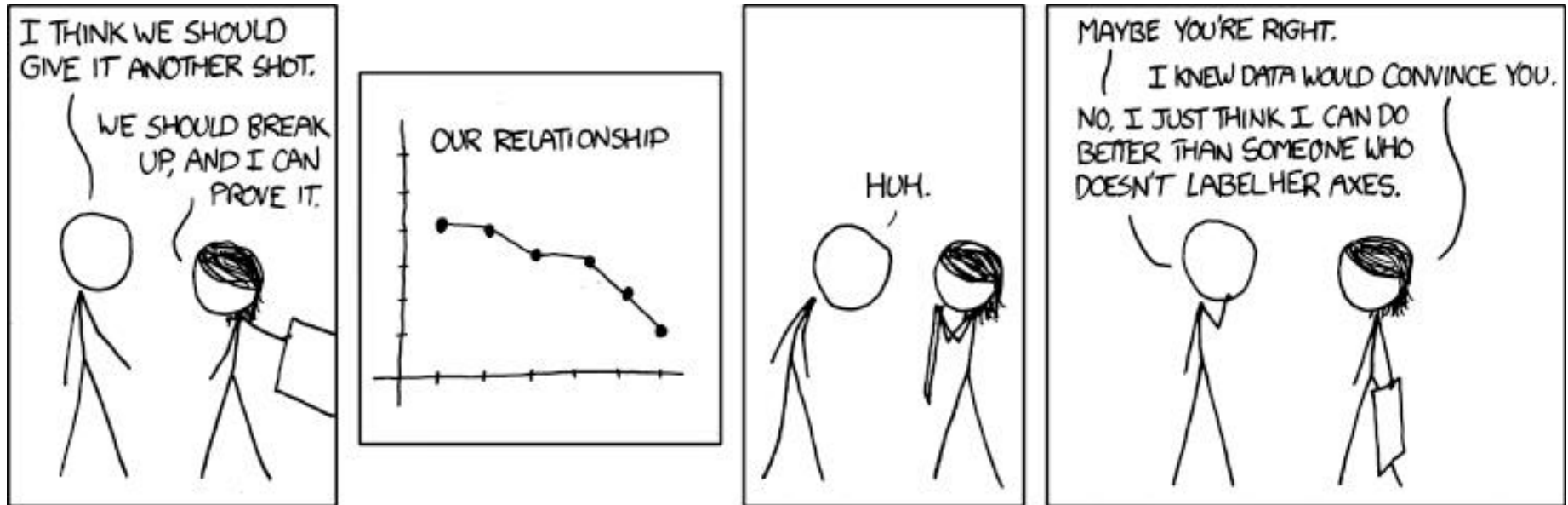


■ Theme Music: Rustcycle

*Capacitance*

■ Cartoon: Randall Munroe

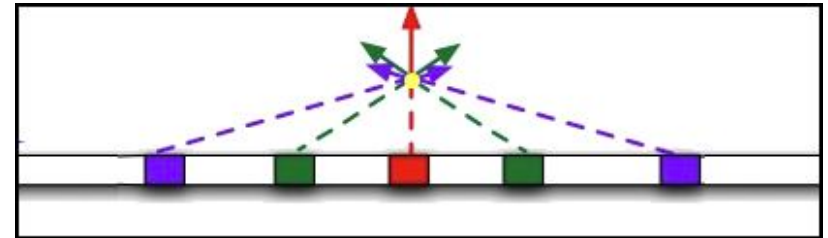
*xkcd*



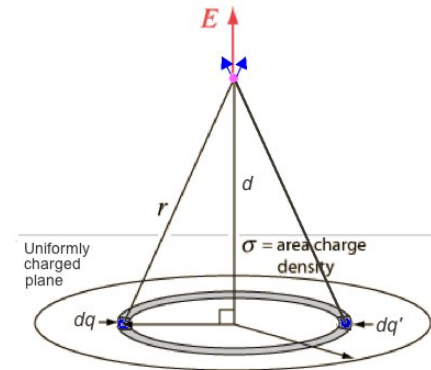
Why?

# Some simple models

■ Line charge  $\lambda = \frac{Q}{L}$



■ Sheet of charge  $\sigma = \frac{Q}{A}$

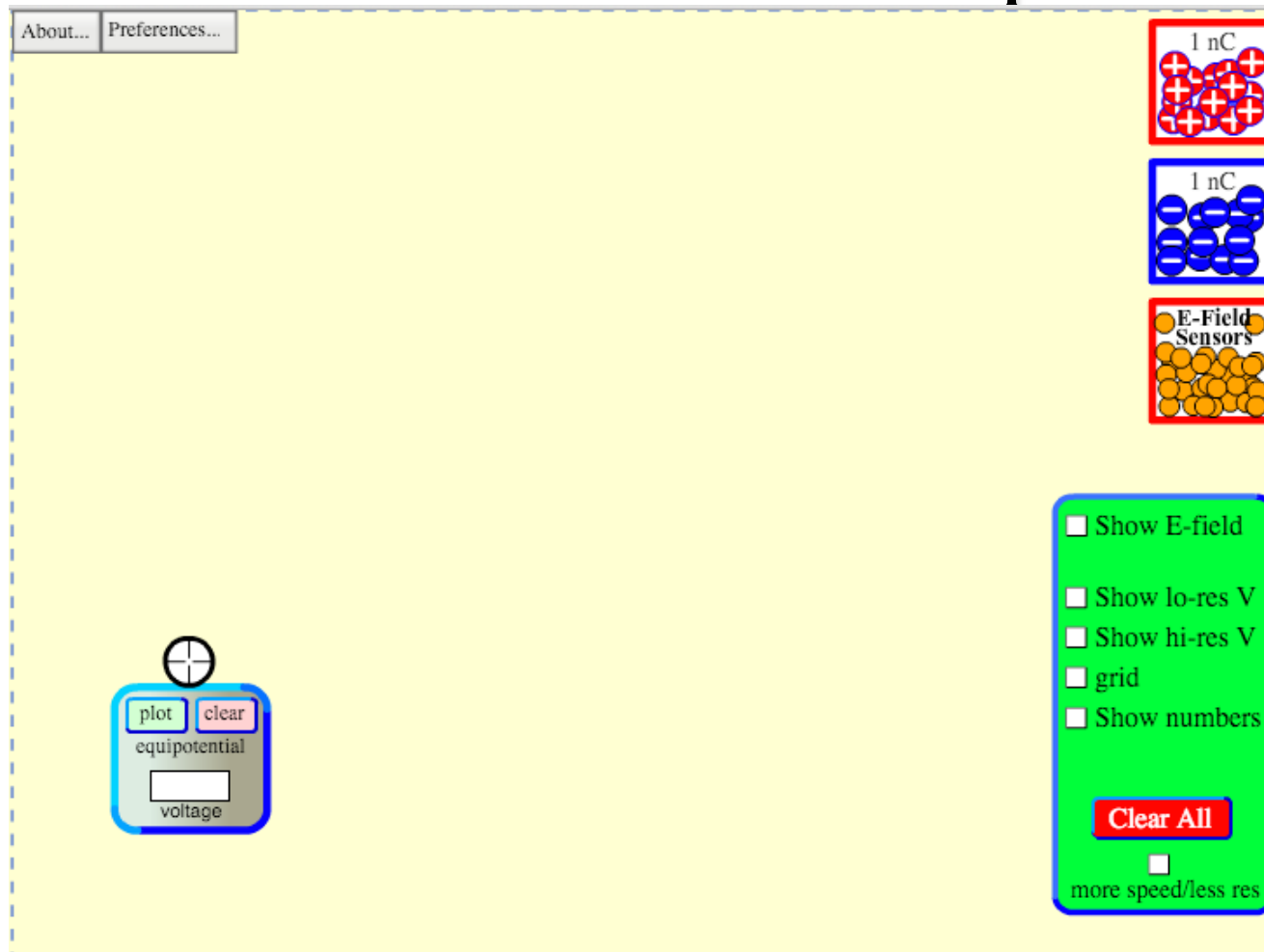


■ Sphere of charge  $\rho = \frac{Q}{V}$  ← Volume!

# Reading question

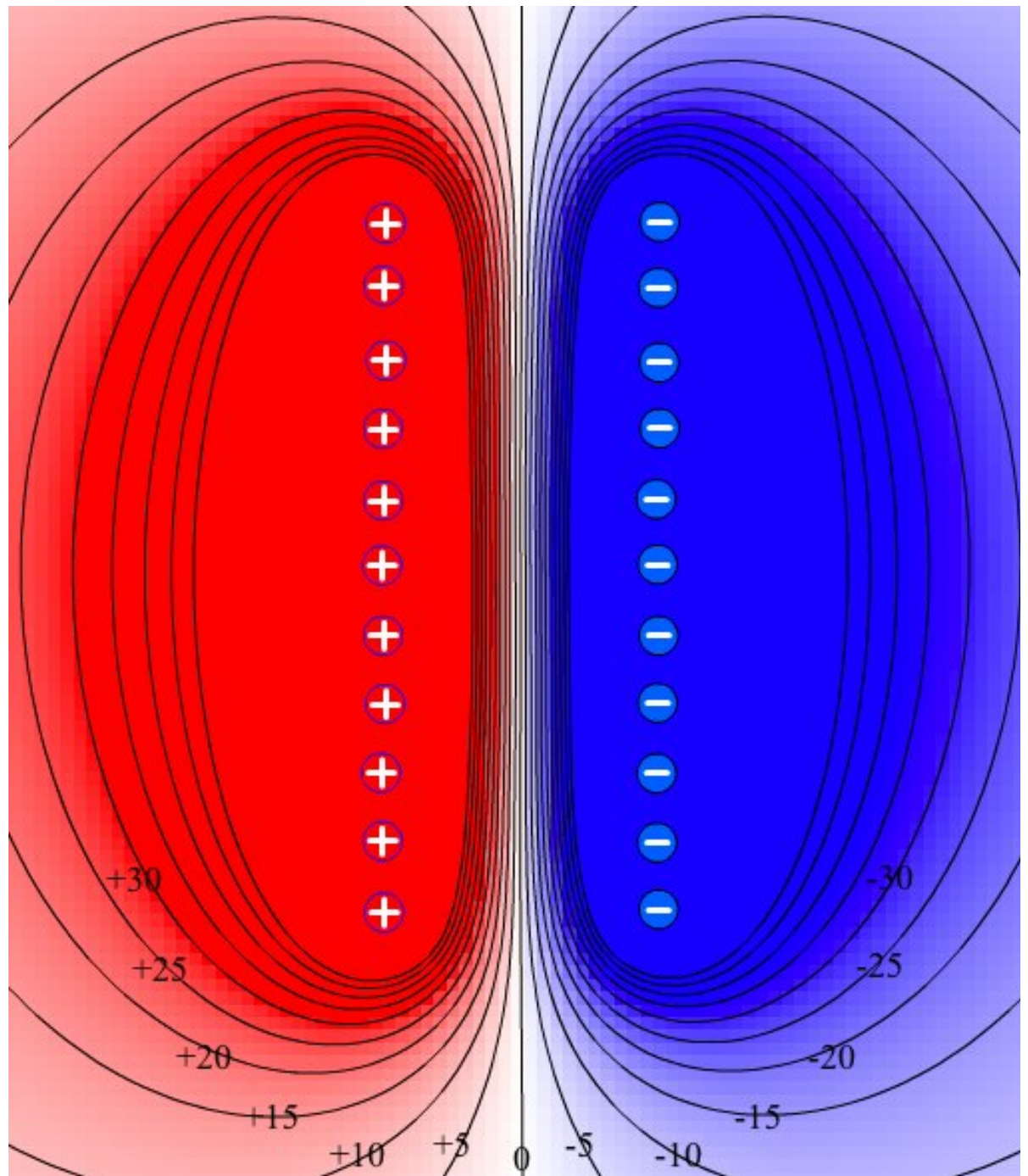
- What is a biological example of a line charge?
  - DNA is negatively charged!

# Build up field of a line charge: What direction will it point?



[https://phet.colorado.edu/sims/charges-and-fields/charges-and-fields\\_en.html](https://phet.colorado.edu/sims/charges-and-fields/charges-and-fields_en.html)

Model of PE  
for 2  
line charges  
(3D)



# The sheet of charge

- Field is constant, pointing away from positive sheet, towards negative sheet.
- Constant!!?  
How can that be?

