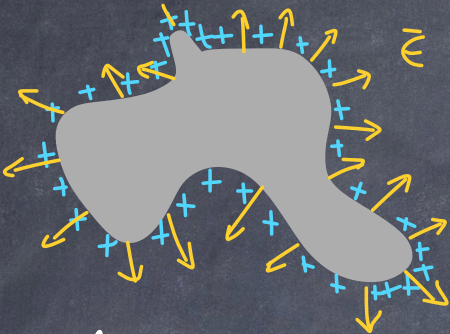


PHY 117 HS2023

Week 9, Lecture 2

Nov. 15th, 2023

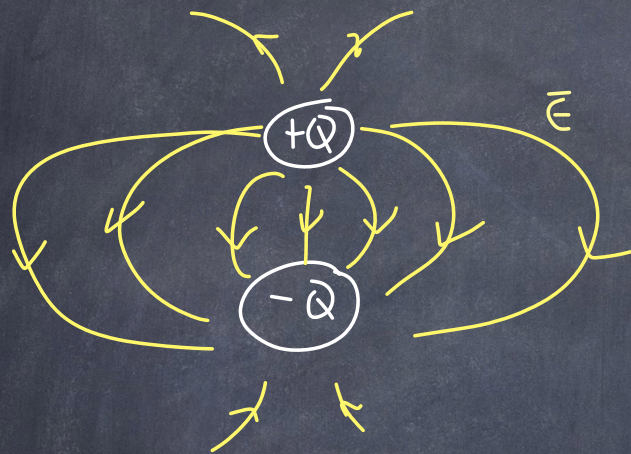
Prof. Ben Kilminster

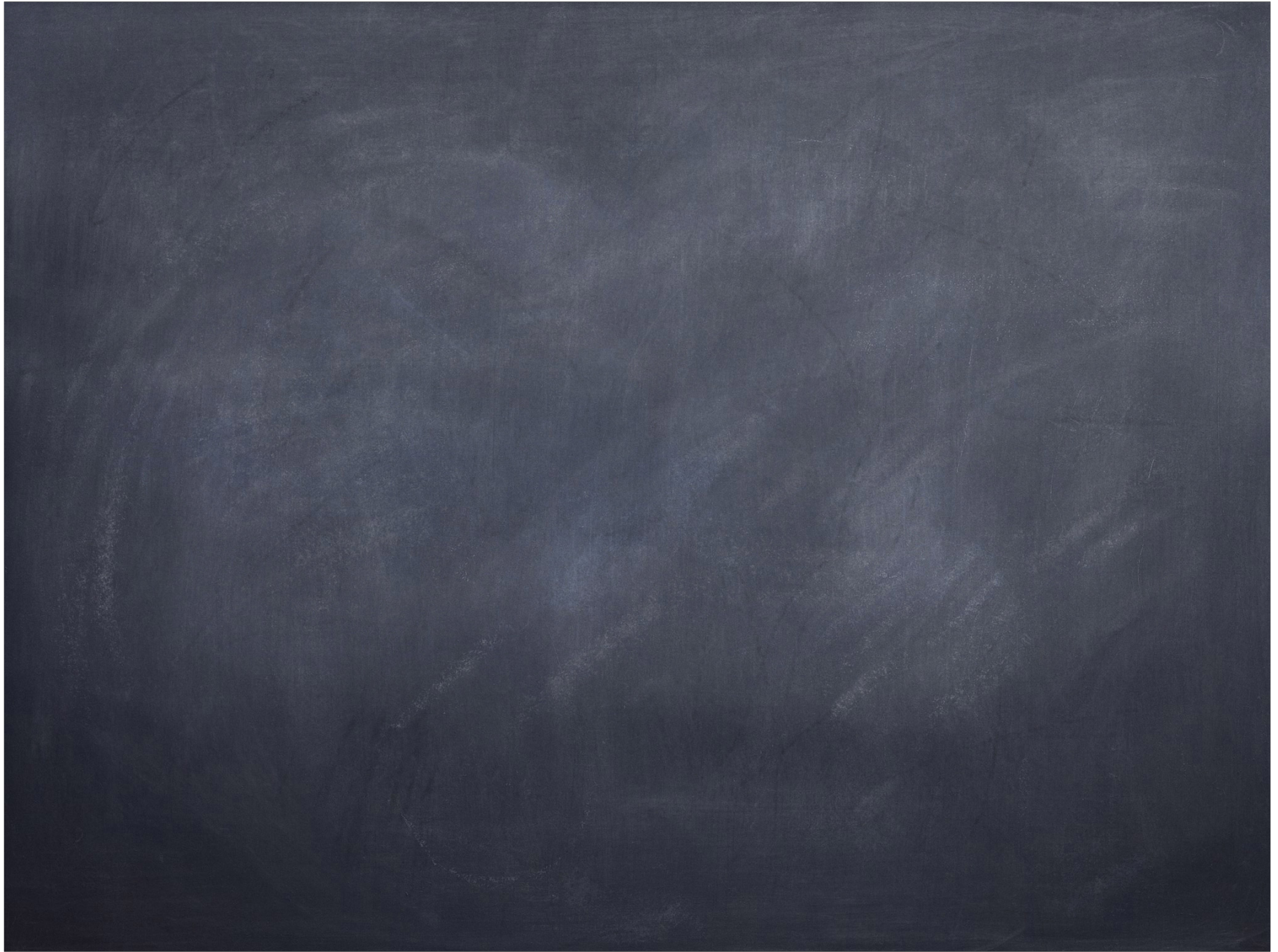


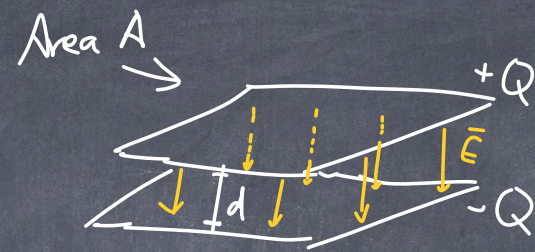
Area A

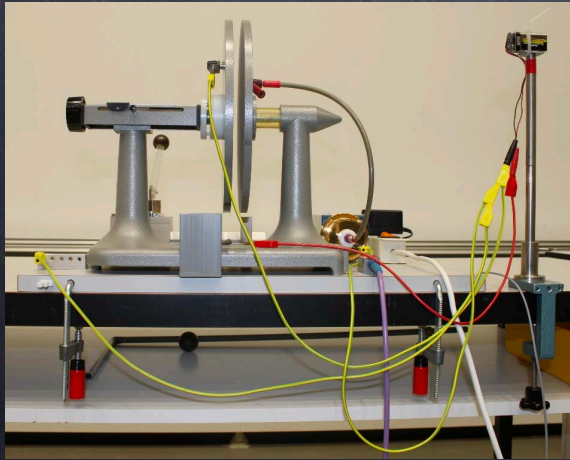
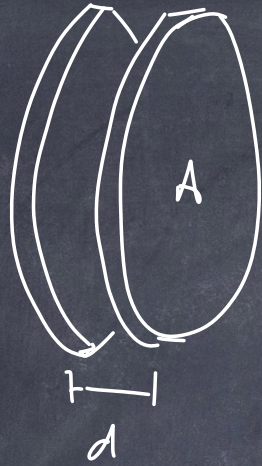


Capacitors :

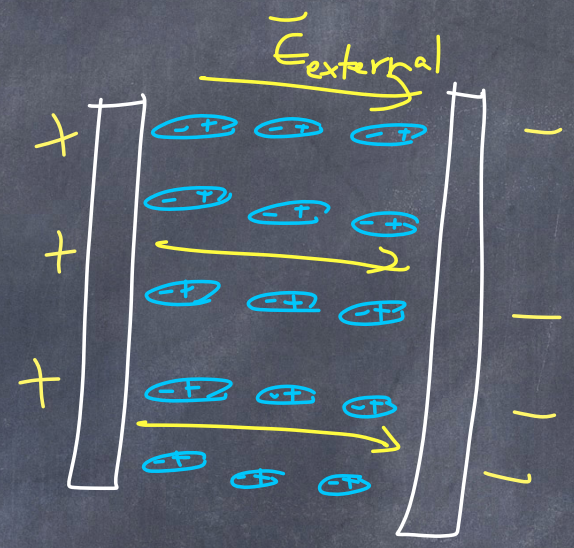
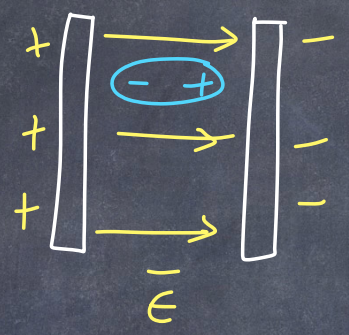






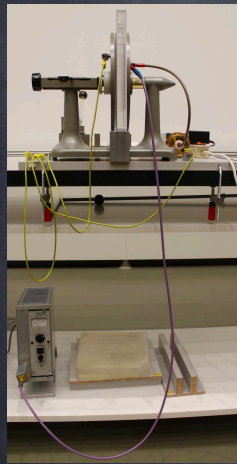
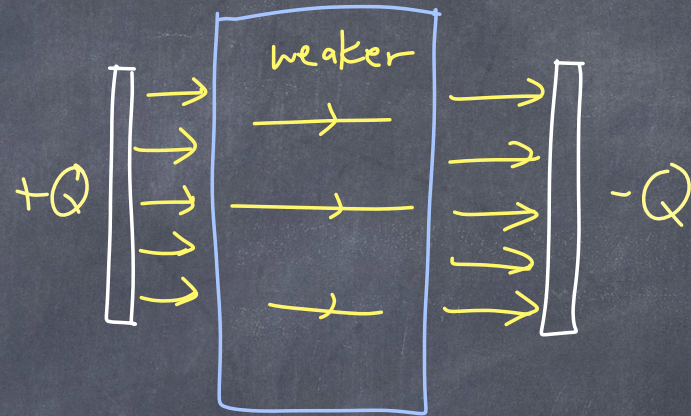
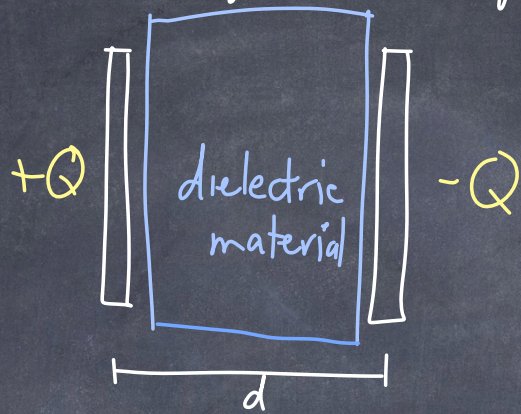


Dielectrics

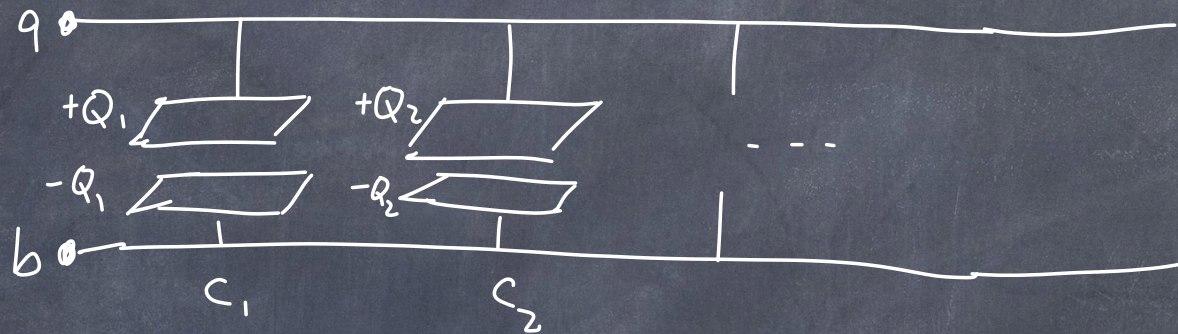


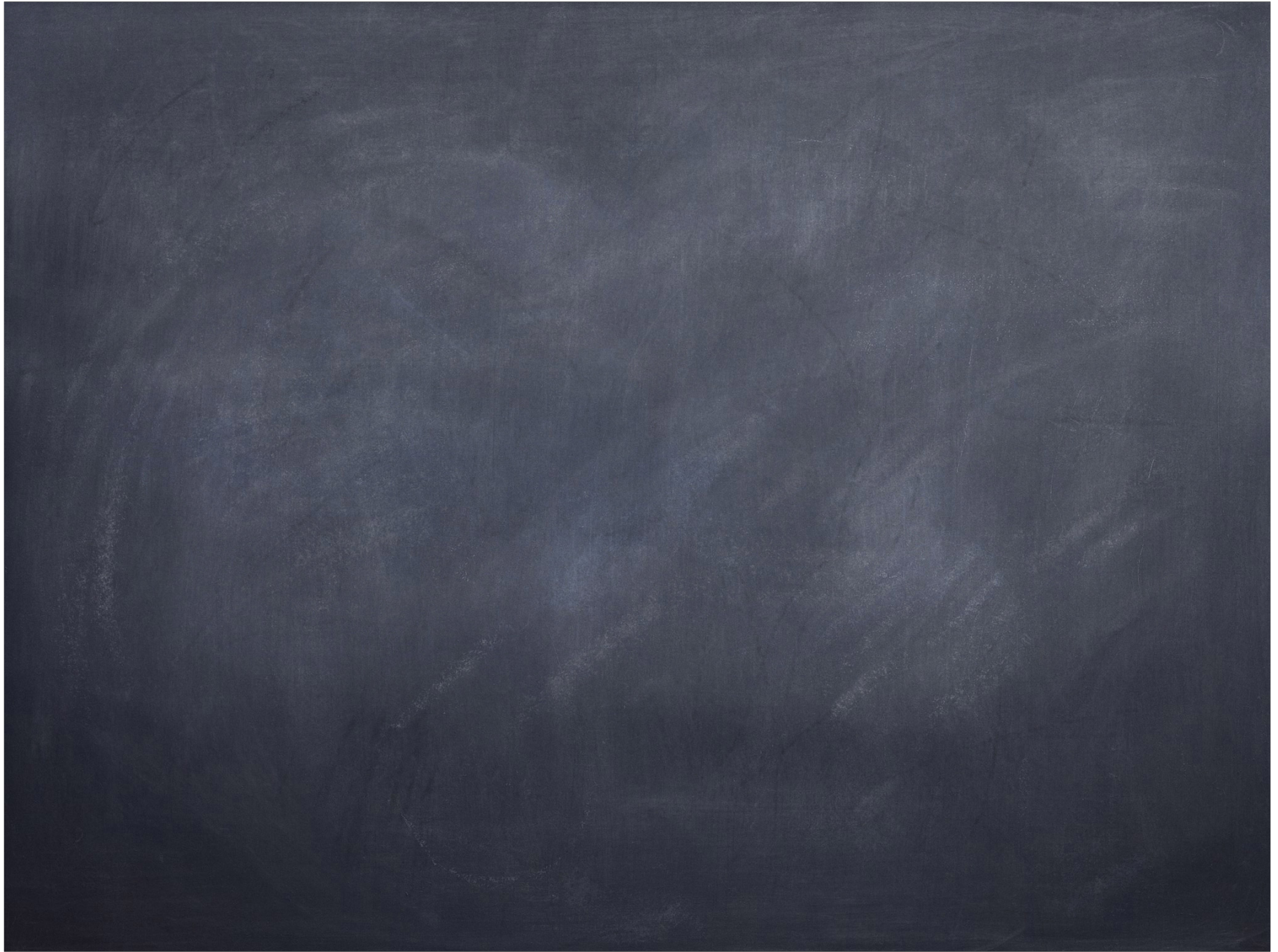
materials	K_d Dielectric constant (no units)
air	1.00059
water	80
paper	3.7
parafin	2
plexiglass	3.4

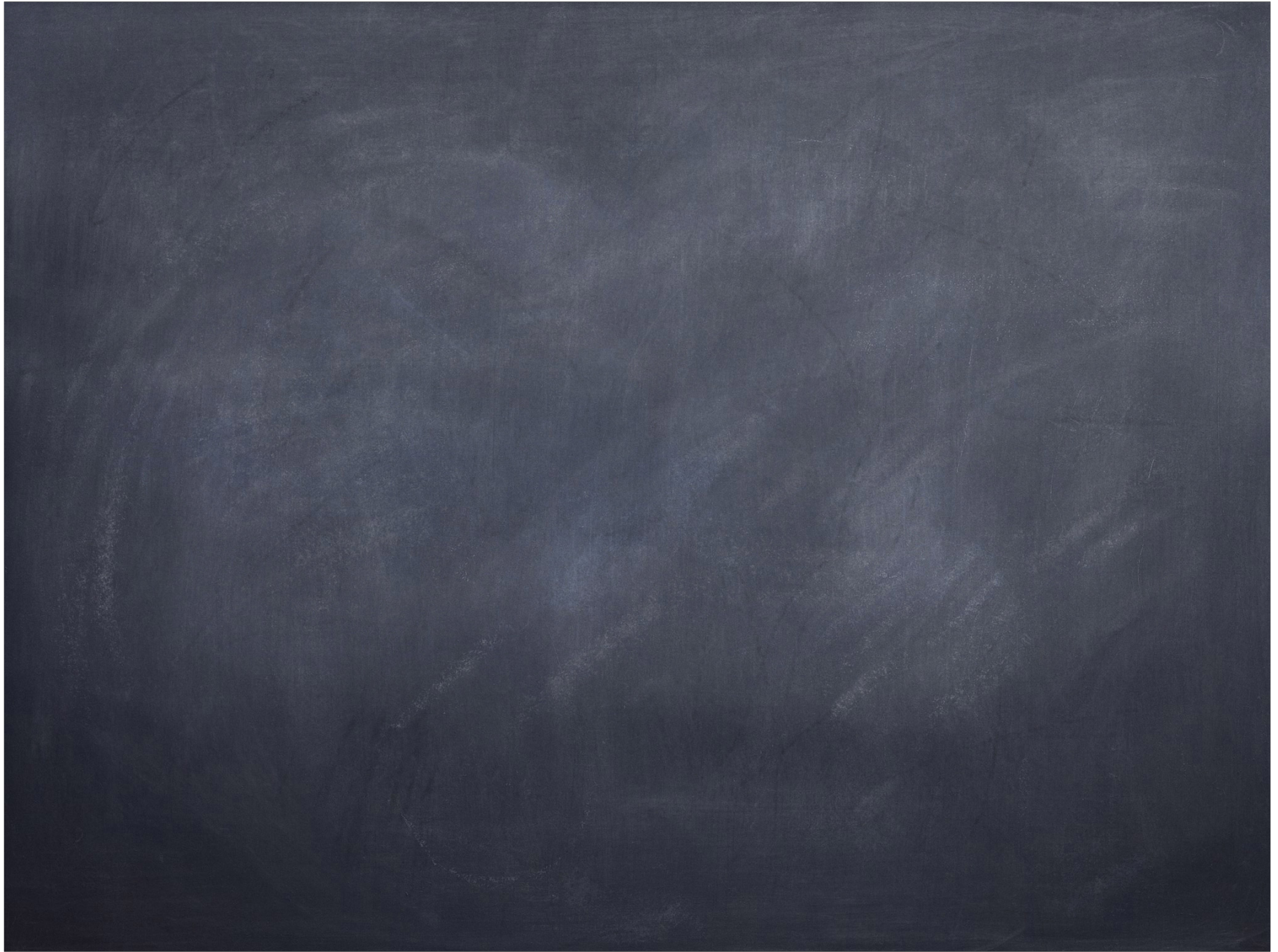
Parallel-plate capacitor with a dielectric



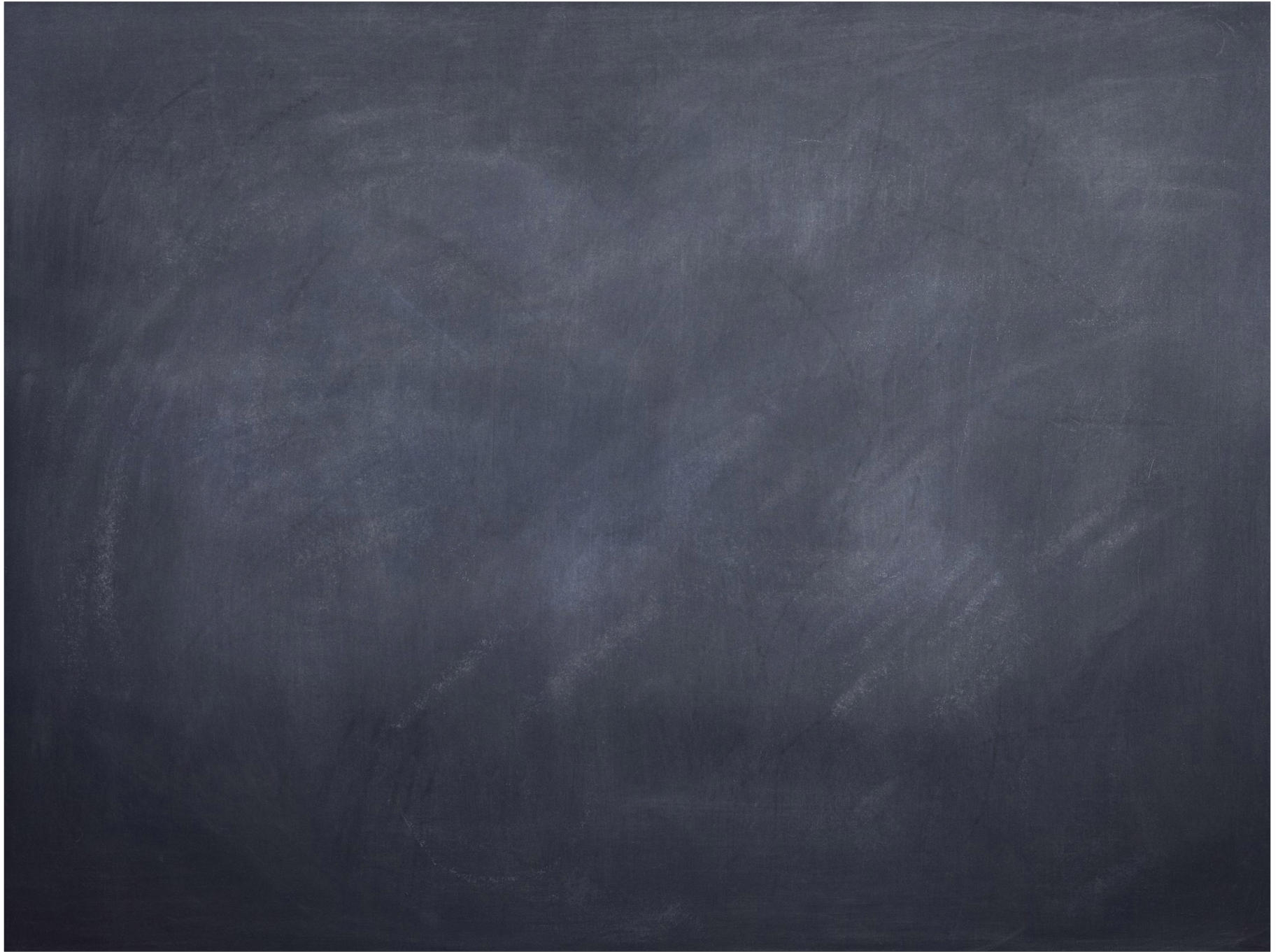
Combining capacitors:





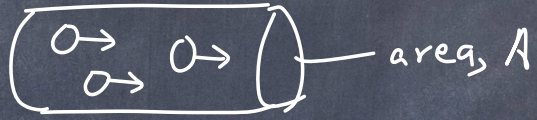






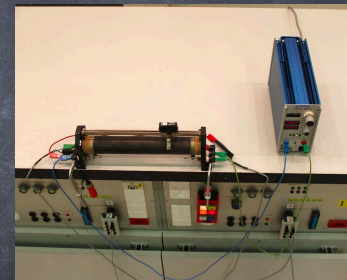
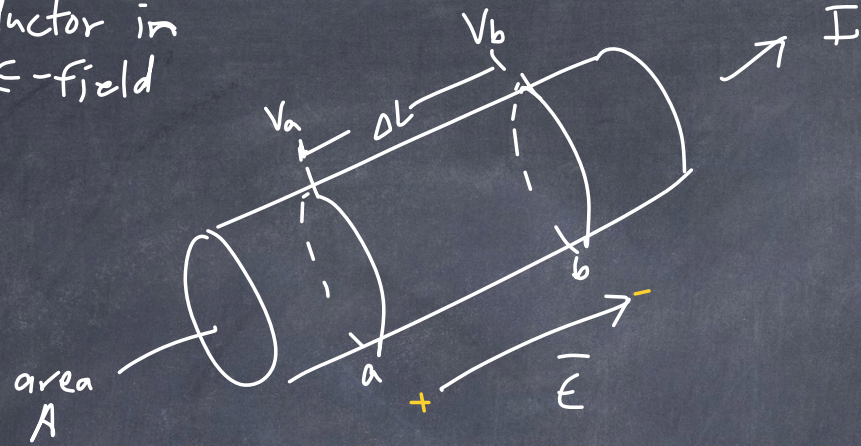


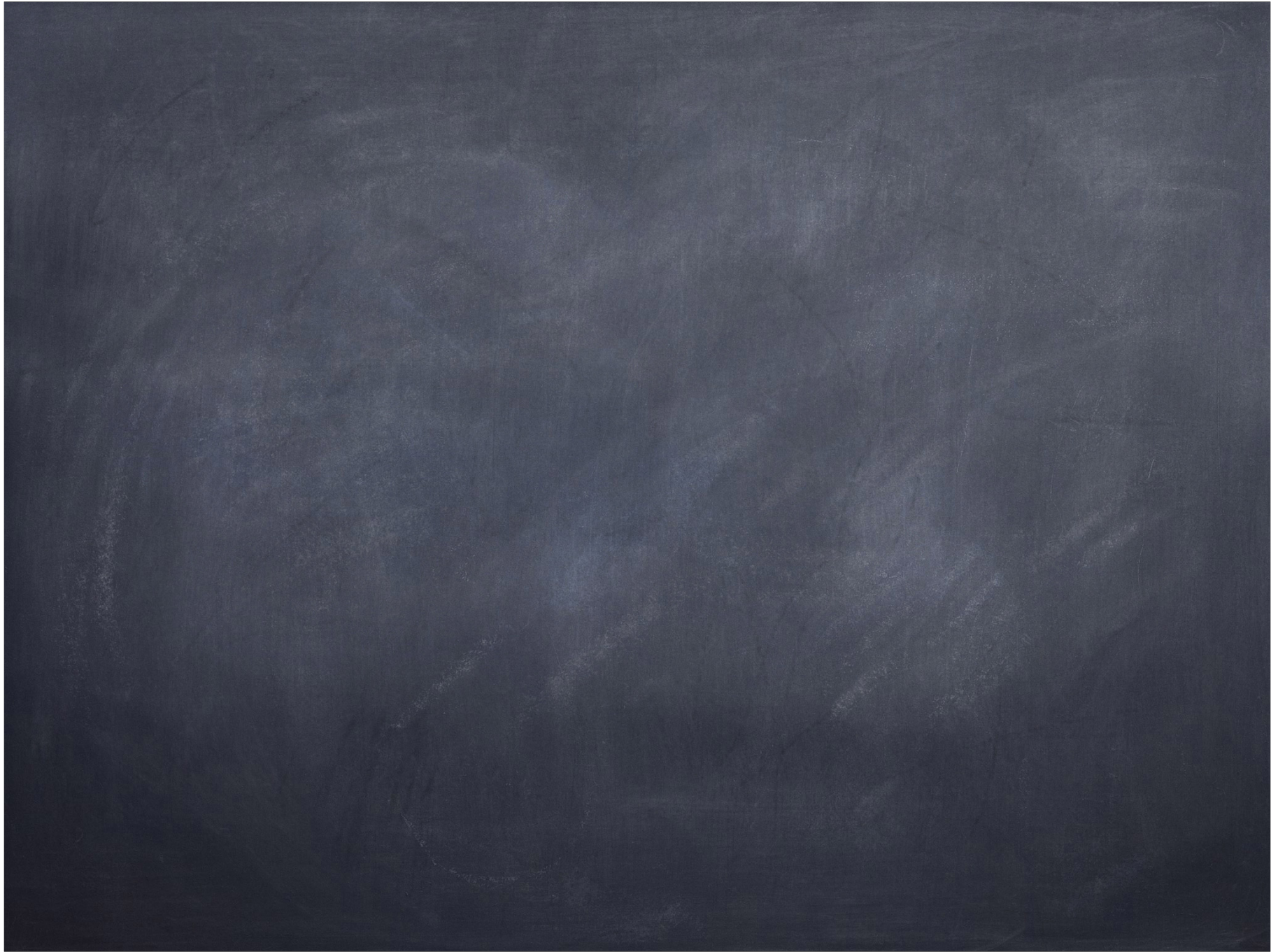
← I





Conductor in
an E -field





material

$\rho_{20} [\Omega \cdot m]$

$\alpha \left[\frac{1}{\text{C}} \right]$

Copper

$1.7 \text{ E} - 8$

$3.9 \text{ E} - 3$

aluminum

$2.8 \text{ E} - 8$

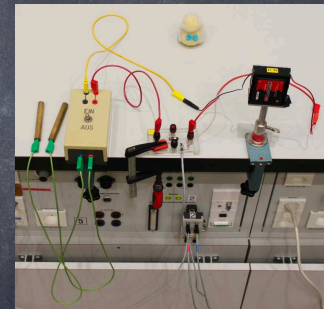
$3.9 \text{ E} - 3$

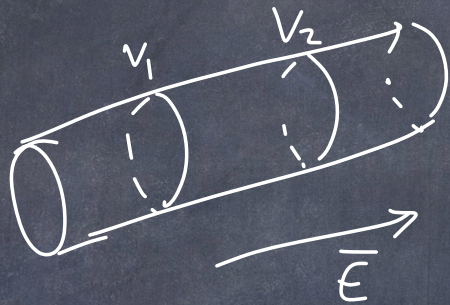
wood

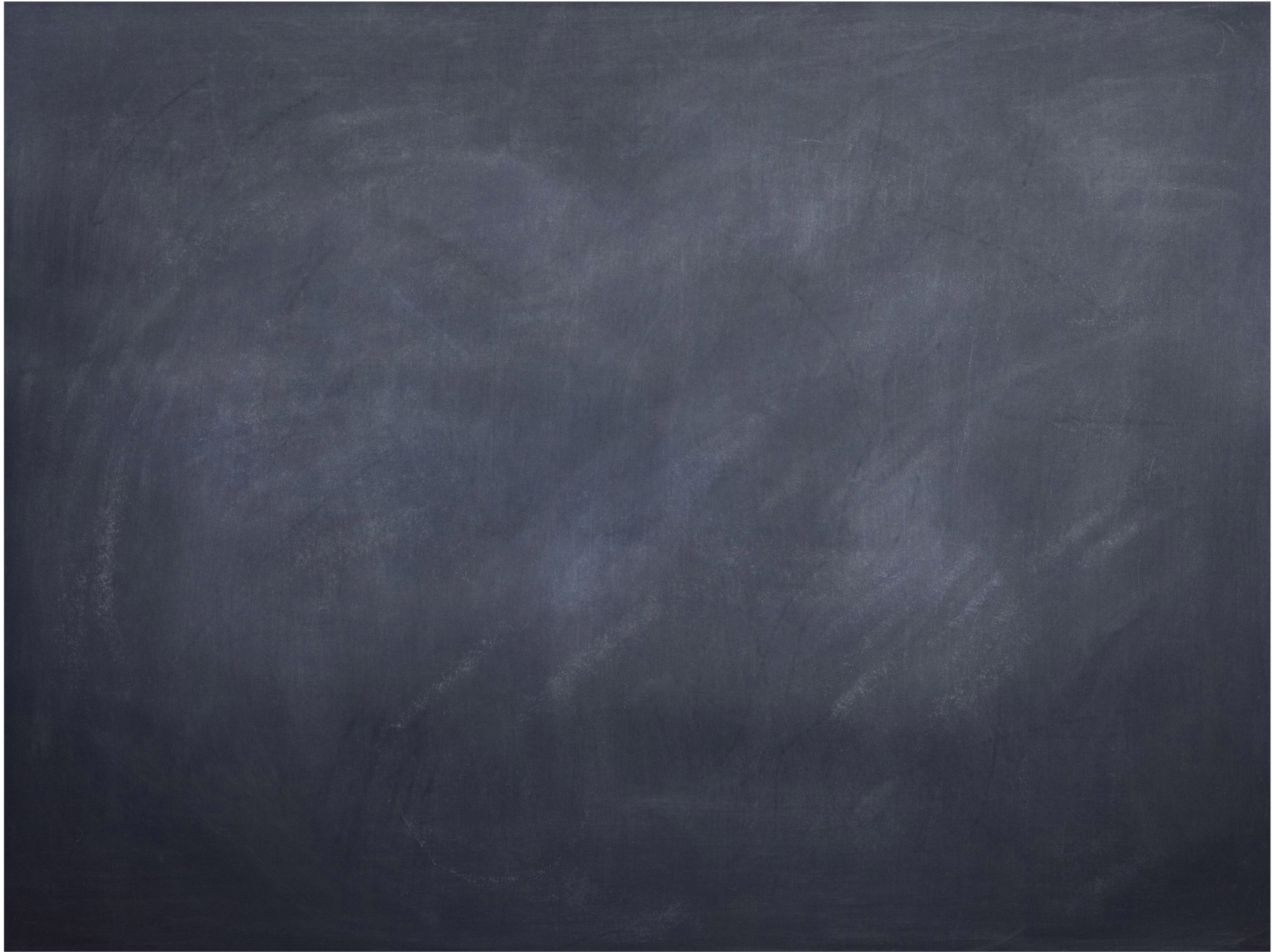
$10^8 - 10^{14}$

glass

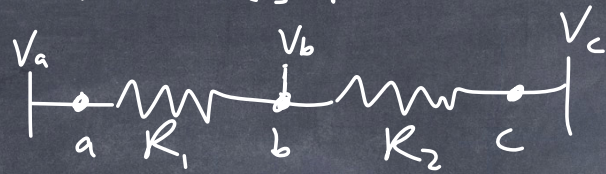
$10^{10} - 10^{14}$



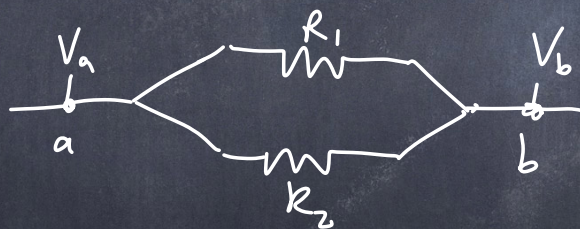




Resistors in series :

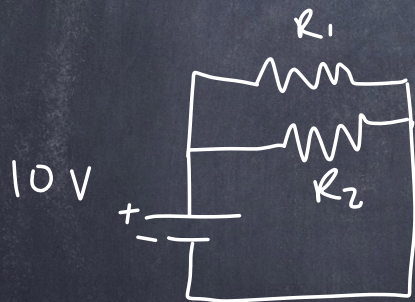
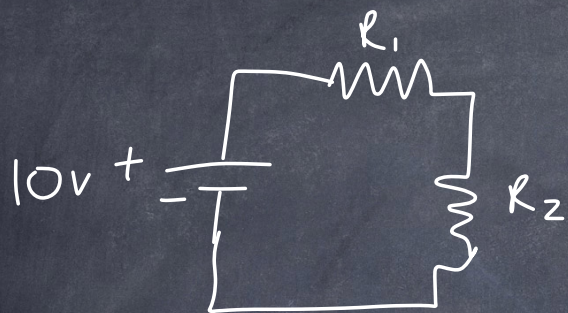


Resistors in parallel :

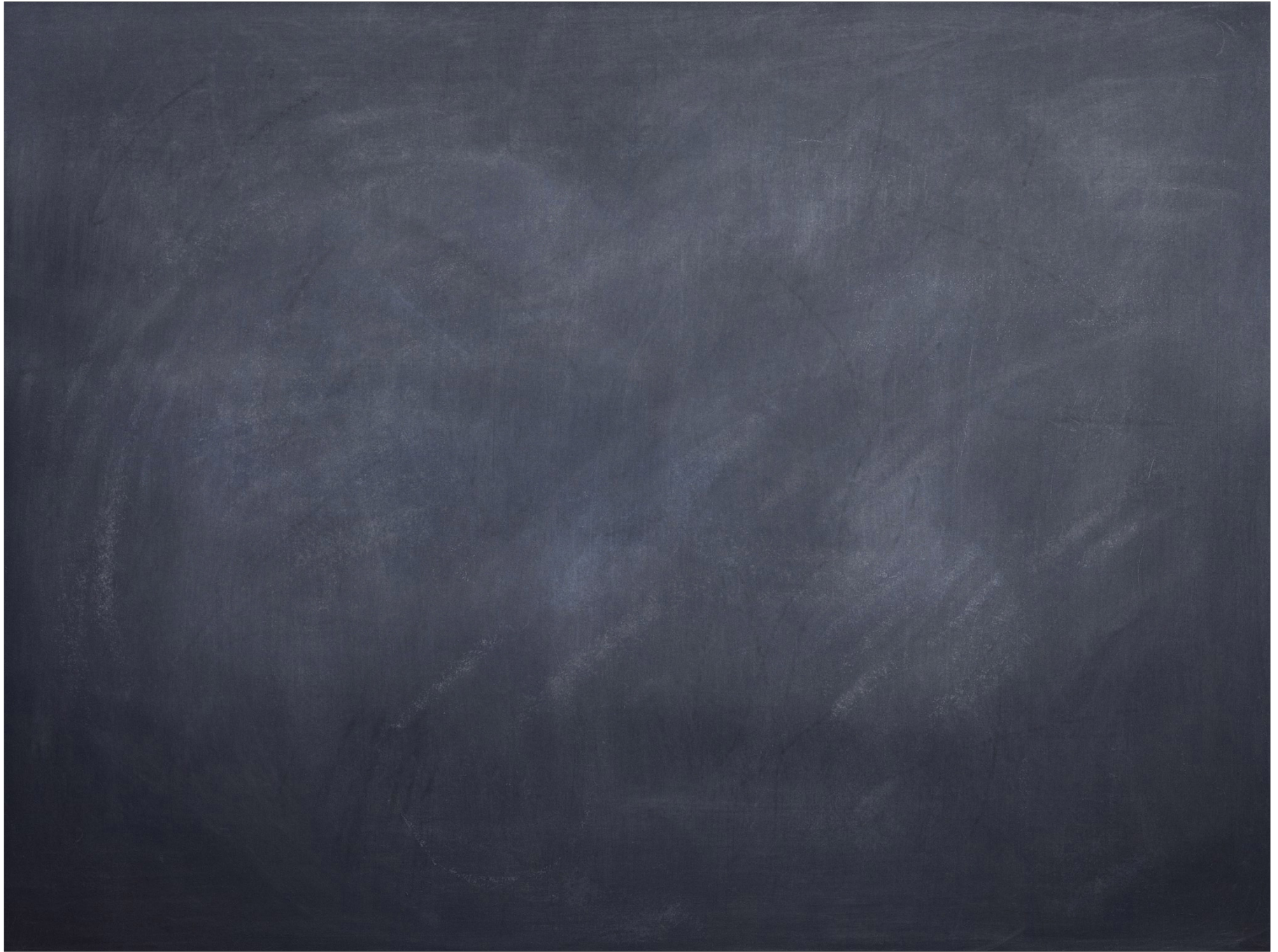


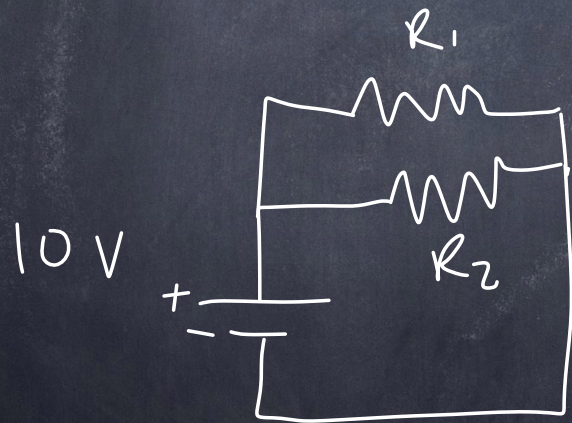
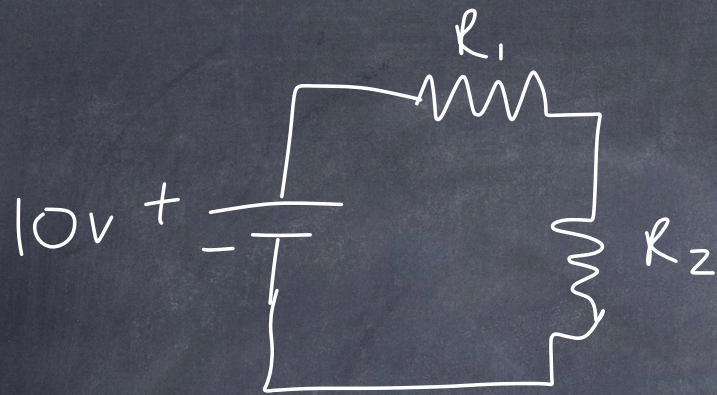
Some examples of circuits

$$R_1 = 1\Omega \quad R_2 = 2\Omega$$

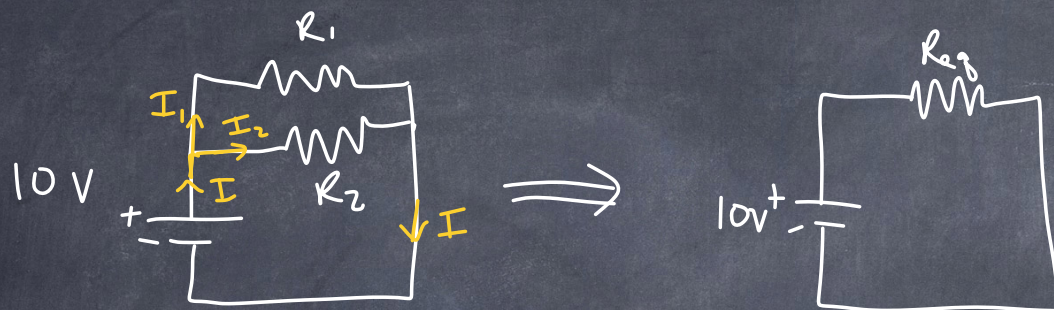


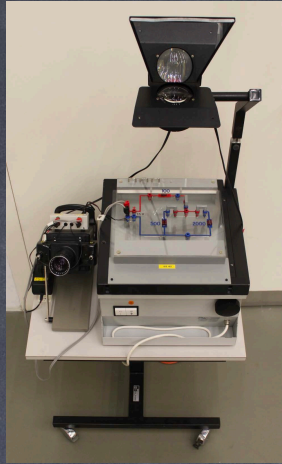
what is total current
and current through
each resistor?





Another way to get the total current, I !

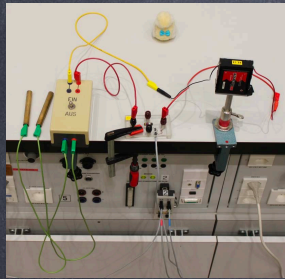




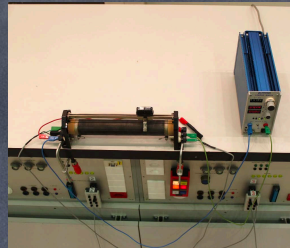
ES62



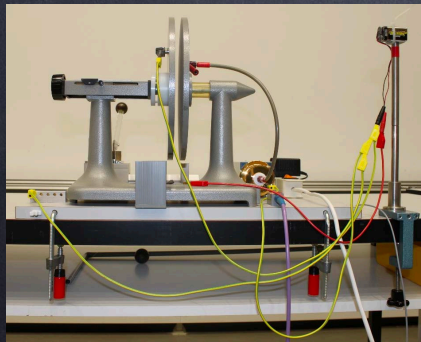
ES28



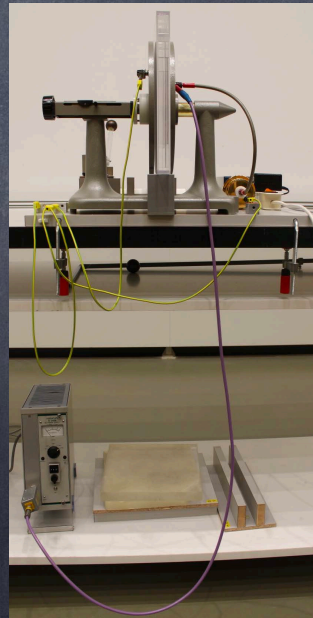
ES70



ES61



ES34



ES44