11

11-15-12 TODAY Q11; grades; CH 22 – end.
Lab questions? (SNM)

$$\left(\frac{\text{QUIZ SCORE}}{175}\right)(24) + \left(\frac{\text{LAB SCORE}}{50}\right)(6) = x$$

$$\left(\frac{x}{30}\right)(100) = \%\text{ round}$$

QUIZ	MAX
Q1	10
Q2	20
Q3	10
Q4	14
Q5	23 (3 EC)
Q6	21 (5 EC)
Q7	19
Q8	37
Q9	16 (2 E.C)
Q10	11 (4 E.C)
	175
+	93 QUIZ 11
	188

phys@ It — 15-12

Project

Explore an article about a scientific event and break it down to SCIENTIFIC METHOD —

(1) "observations" of something.

(2) hypothesis: key ASSUMPTIONS of the THEORY

(3.) * consequences of hypothesis

(4) experiments

(5) GENERAL THEORY:

* important: help set-up experiment

other "Behind the scenes" consequences

article sources: ie VRL ending in edu, org, ETC
- Sciamer.
- NY Times
- Respected
  - POPULAR
  - internet
  - MAGAZINES

NOTE: TRY TO use more than one source.

Anatomy of Project:

event in article

JOURNALISM'S creed:
- WHAT?
- WHEN?
- WHO?
- WHERE?
- WHY?
- HOW?

(5 W's) In.

1. * What? explain what is happening:
2. What THEORY and hypothesis upon WHICH the event is based?

3. mention experiments supporting Theory.

4. other consequences of the theory upon which this event is based?

chapter 22 ! ch 20

ch 22 start

charges: ← D → unlike

⊕ → ← ⊖

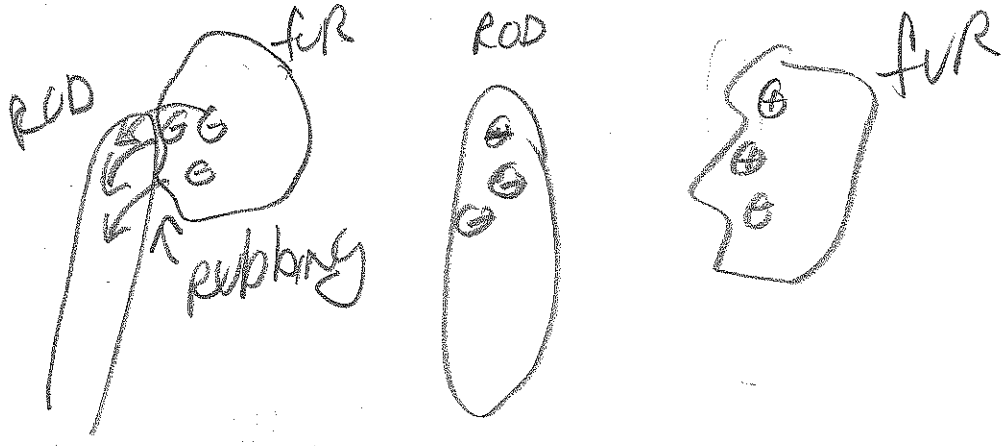
F F

← ⊕ F

⊕ → F like

conservation of charge

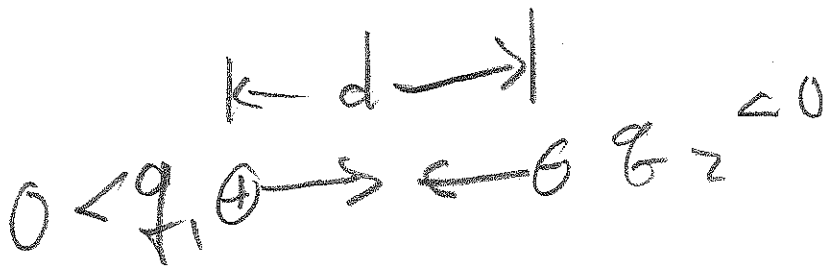
fig 22.3

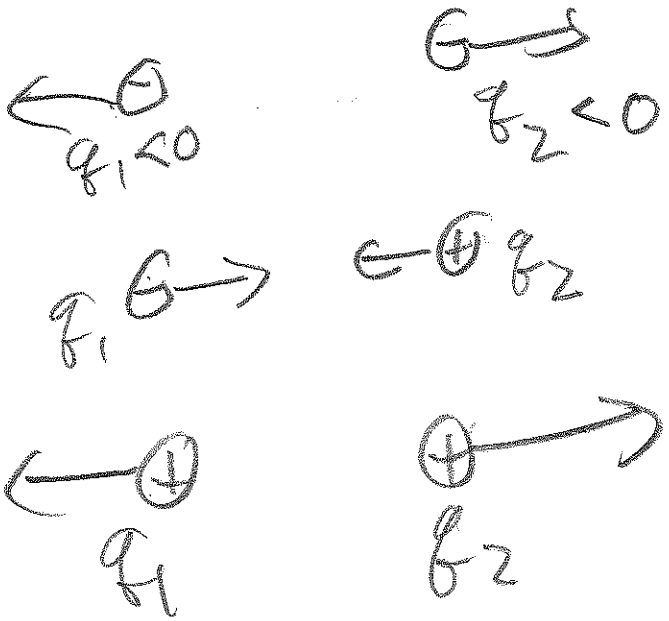


coulomb's LAW

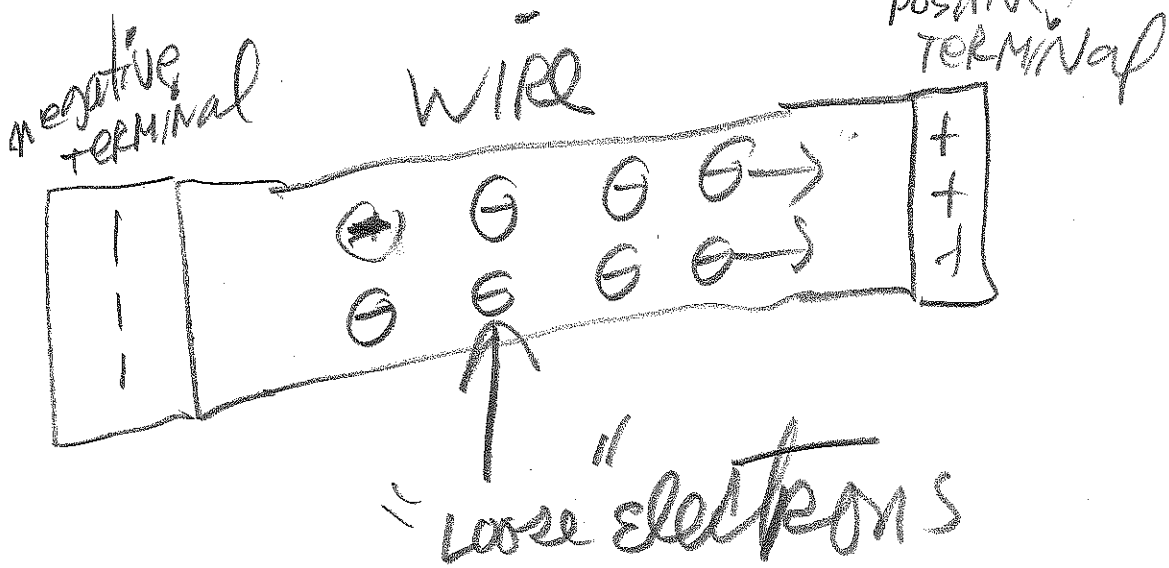
$$F = \frac{k|q_1 \cdot q_2|}{d^2}$$

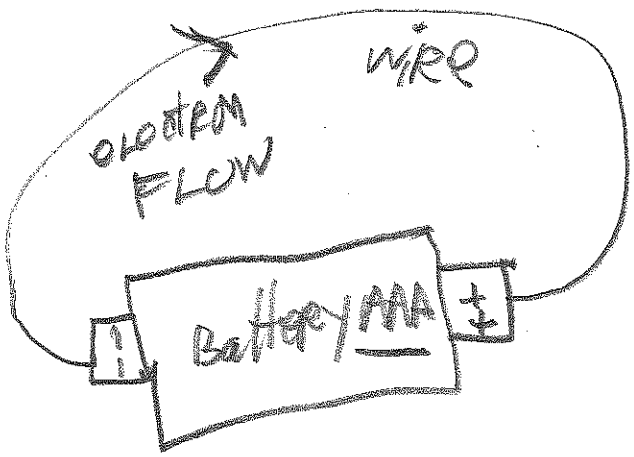
← absolute value



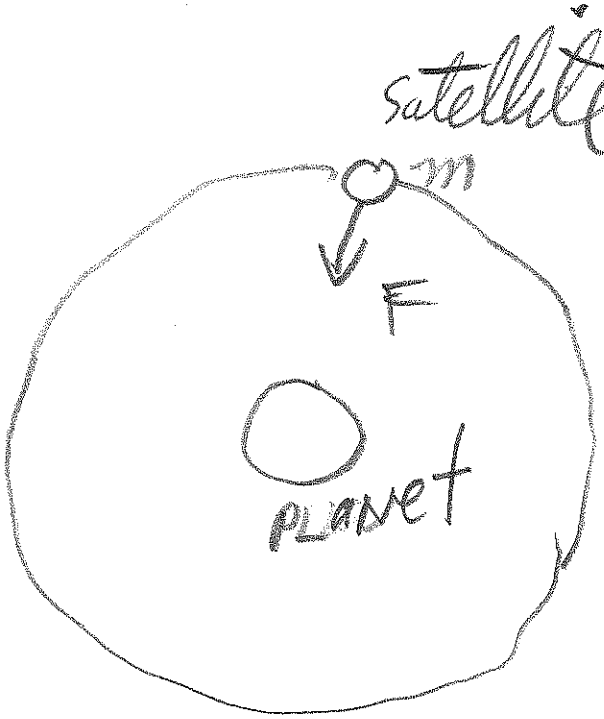


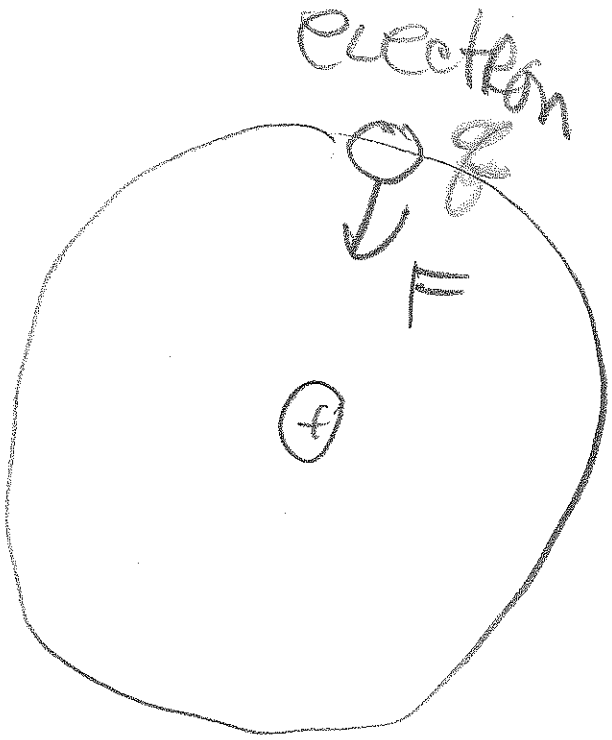
Electrical conductors are good heat conductors: loose electrons!





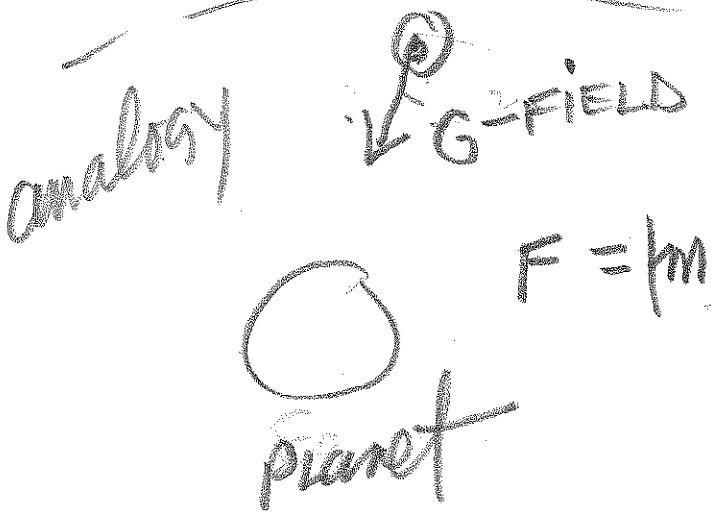
Electric FIELD





$F = |q \cdot \text{FIELD}|$

analogy



|FIELD| = magnitude of FIELD

Example

$F_2 = q_2 E_1$

$F_{21} = \frac{k|q_1 q_2|}{d^2}$

F_{21} = force on 2 from 1.

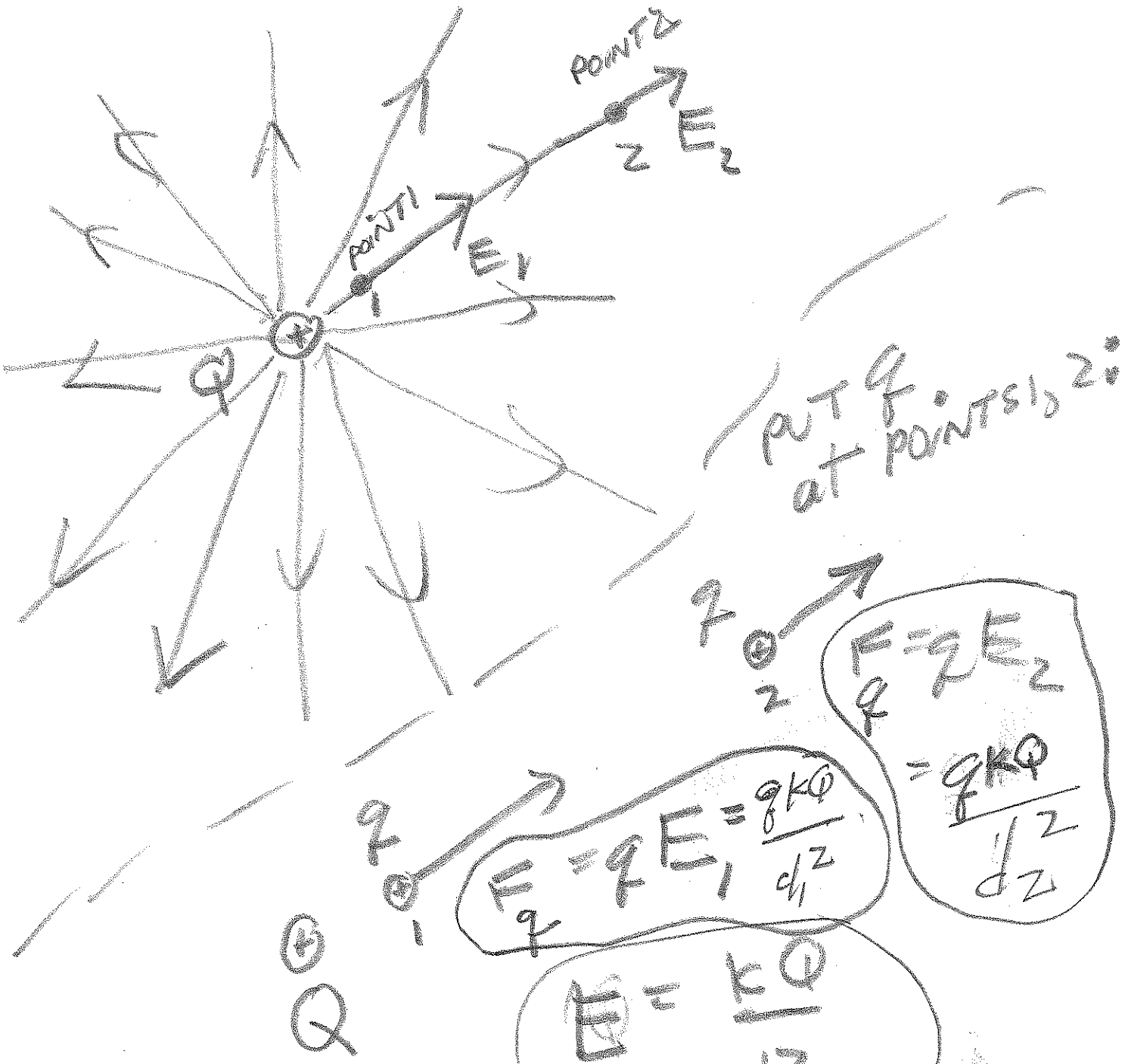
$E_1 = \frac{1}{q_1} F_{21}$

$E_1 = \frac{1}{|q_1|} \frac{k|q_1 q_2|}{d^2}$

$E_1 = \frac{k|q_1|}{d^2}$

FIELD from 1.

FIELD lines


POINT 2
E_2
POINT 1
E_1
+Q
put q at points 1 & 2
q
2
$F_q = qE_2$
$= \frac{qkQ}{d_2^2}$
q
1
$F_q = qE_1 = \frac{qkQ}{d_1^2}$
+Q
$E = \frac{kQ}{d^2}$

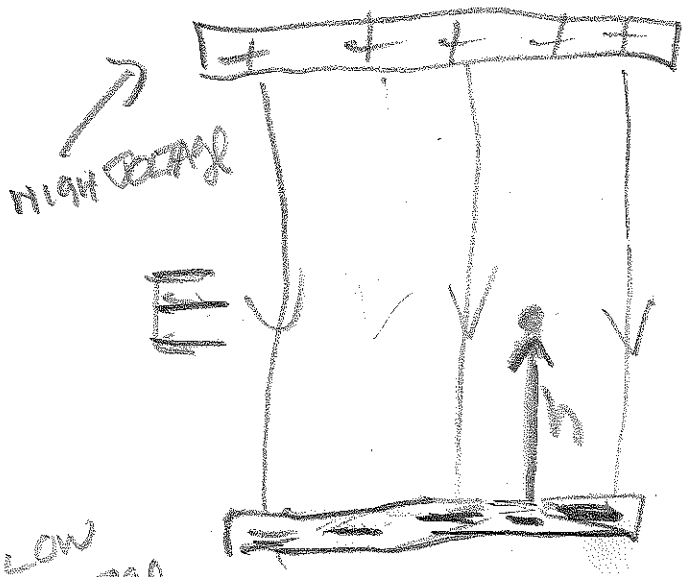
electric potential

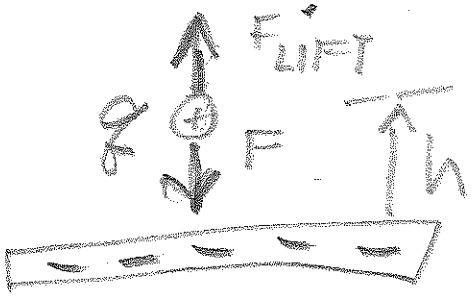
$$\text{VOLTAGE} = \frac{PE}{q}$$

$$\text{VOLTAGE} = E \cdot h$$

$$PE = F_{LIFT} \cdot h$$

$$PE = qE \cdot h$$

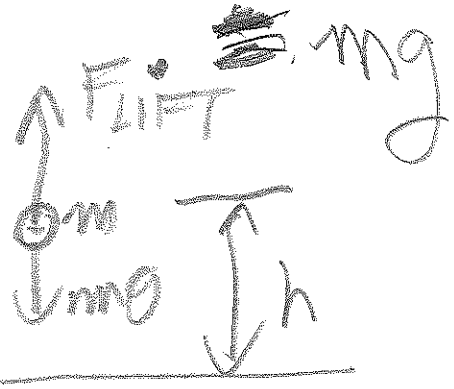




gravity:

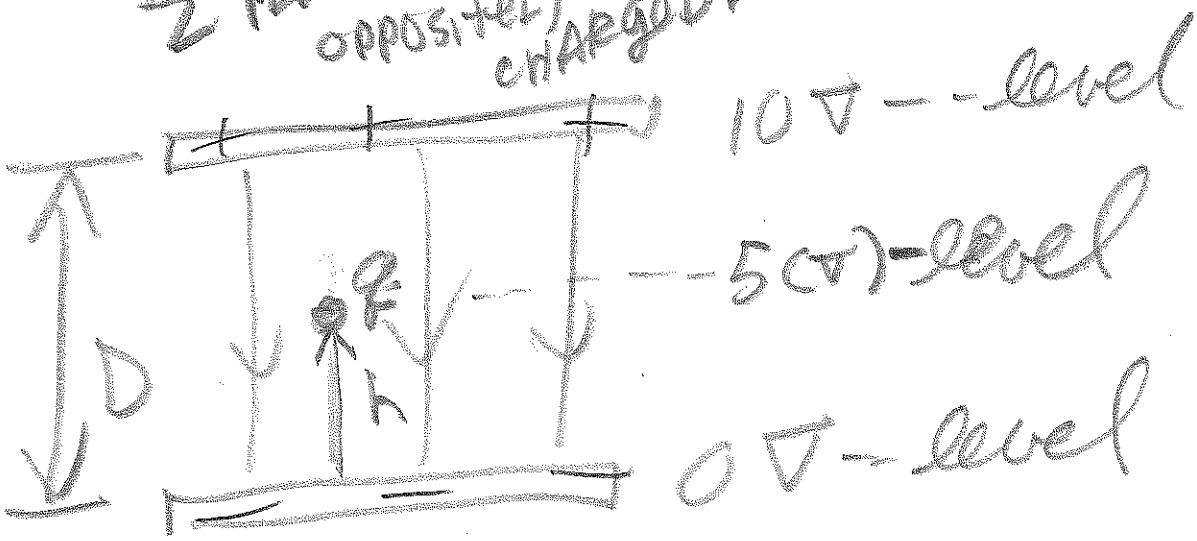
$$PE = mgh$$

$$= F_{LIFT} \cdot h$$



Example: FIND PE given voltage.

2 plates: oppositely charged.



PE = q · VOLTAGE

= q · Eh

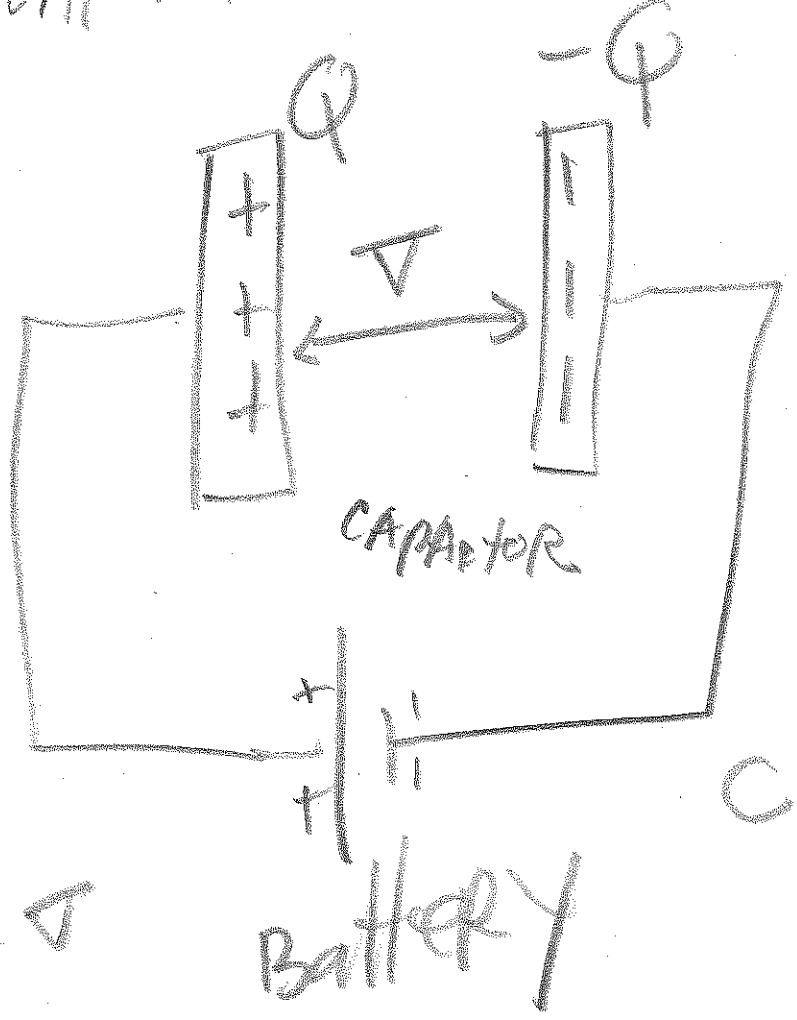
= q · 5 (V) $\left(h = \frac{D}{2}\right)$

(Joules)

IF q = 2C)

PE = 10 J.

capacitors hold energy.



$C \equiv \frac{Q}{V}$

$V = V_+ - V_-$

Energy of capacitor $= \frac{1}{2} Q V$

→ $\frac{1}{2}$ charge · voltage

$= \frac{1}{2} Q \frac{Q}{C}$

$= \frac{Q^2}{2C}$