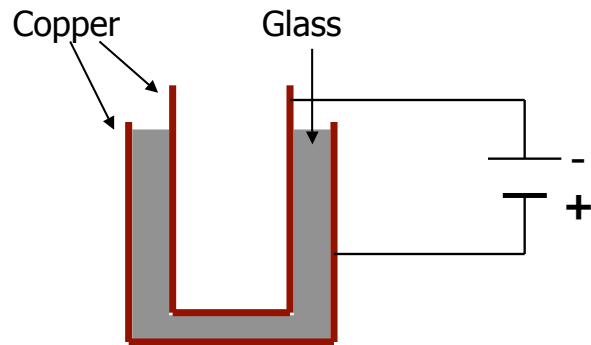


## 'Puzzle' Demo



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## 'Puzzle' Demo

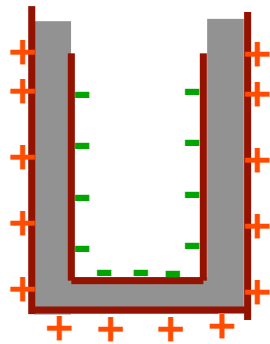
- Where does the charge sit for second spark?

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## 'Puzzle' Demo

Start with charged capacitor

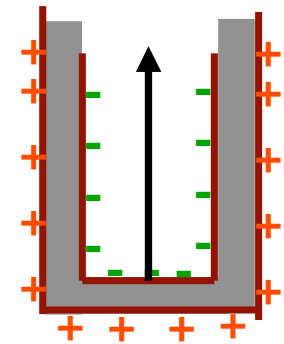


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## 'Puzzle' Demo

Disassemble capacitor

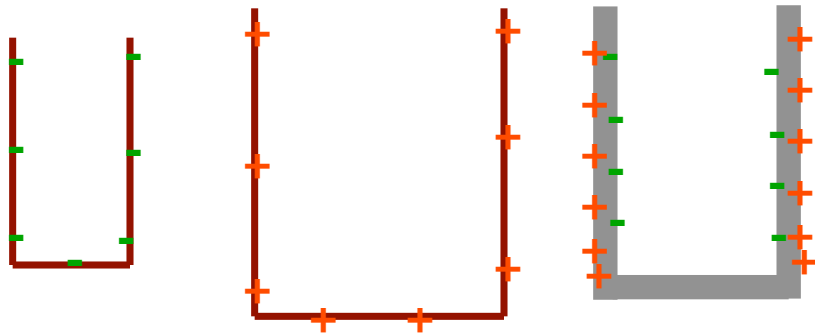


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### 'Puzzle' Demo

Some charge gets 'left behind' on glass

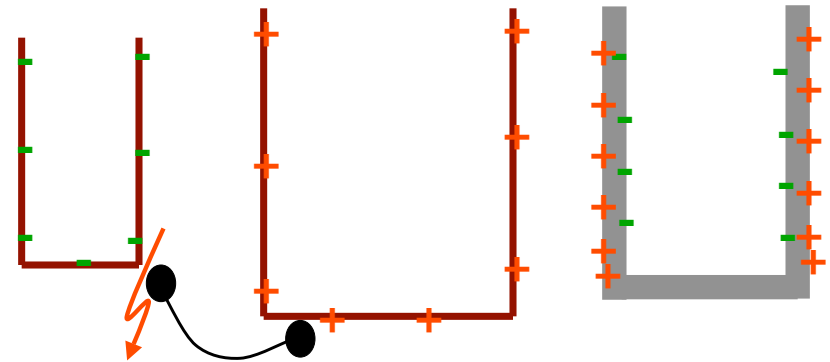


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### 'Puzzle' Demo

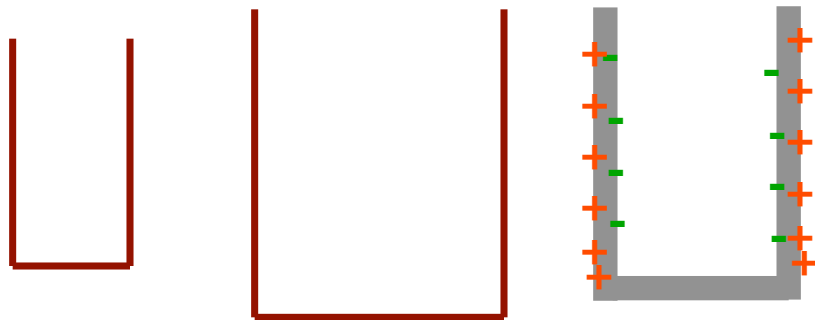
Discharge conductors



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### 'Puzzle' Demo

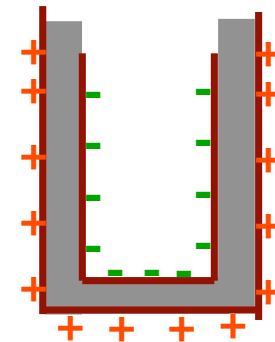


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### 'Puzzle' Demo

Re-assemble capacitor

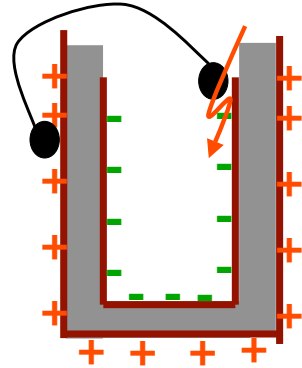


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## 'Puzzle' Demo

Discharge capacitor

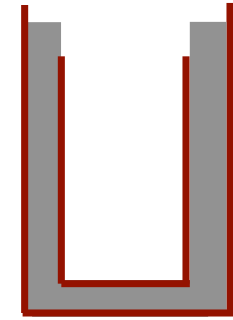


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web.mit.edu/8.02x/www

## 'Puzzle' Demo

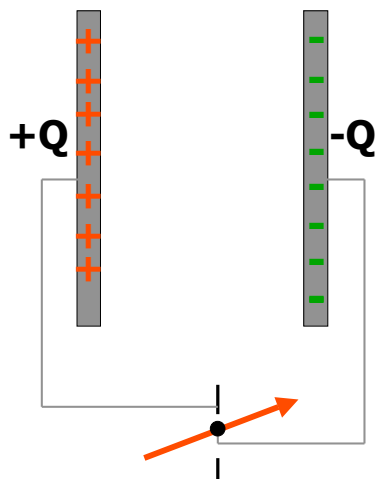
Done...



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web.mit.edu/8.02x/www

## Dielectric Demo

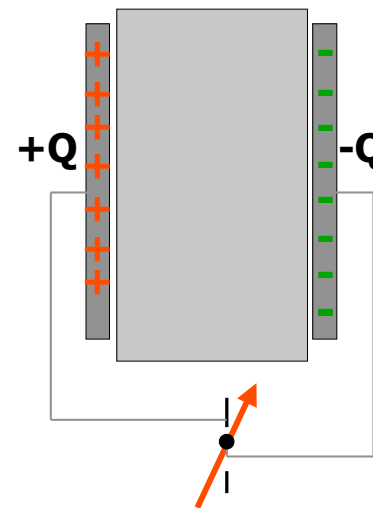


- Start w/ charged capacitor
- $d$  big  $\rightarrow$   $C$  small  $\rightarrow$   $V$  large

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web.mit.edu/8.02x/www

## Dielectric Demo

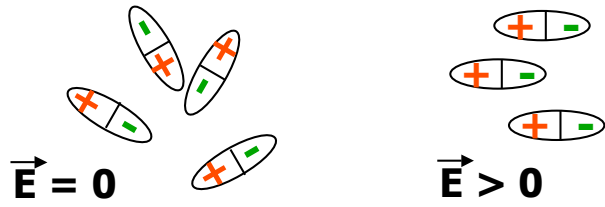


- Start w/ charged capacitor
- $d$  big  $\rightarrow$   $C$  small  $\rightarrow$   $V$  large
- Insert Glass plate
- Now  $V$  much smaller
- $C$  bigger
- But  $A$  and  $d$  unchanged !
- Glass is a Dielectric

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web.mit.edu/8.02x/www

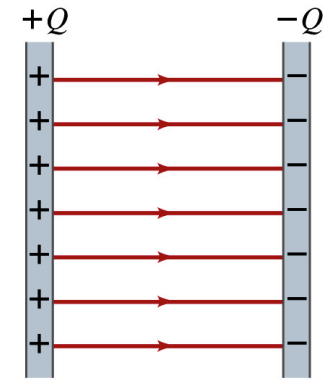
## Microscopic view



## Polarization

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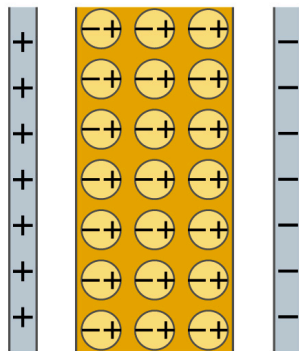
[web.mit.edu/8.02x/www](http://web.mit.edu/8.02x/www)



(a)

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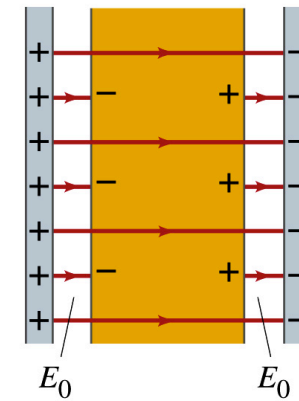
[web.mit.edu/8.02x/www](http://web.mit.edu/8.02x/www)



(b)

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[web.mit.edu/8.02x/www](http://web.mit.edu/8.02x/www)



(c)

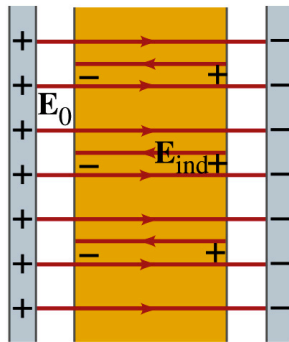
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[web.mit.edu/8.02x/www](http://web.mit.edu/8.02x/www)

## Dielectric Constant

- Examples

Material	K
Vacuum	1
Air	1.0006
Plexiglass	3.4
Water	80.4
Ethanol	23
Ceramics	~5000
Glass	5-10



(d)

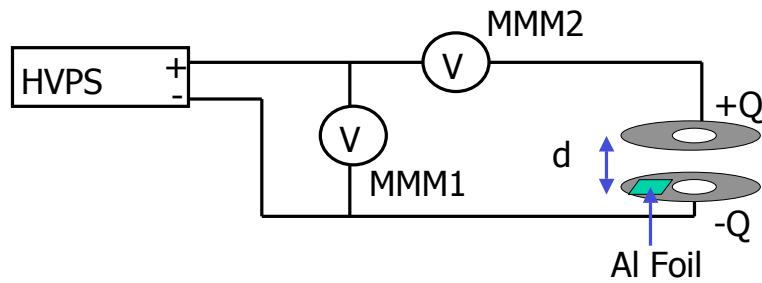
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[web.mit.edu/8.02x/www](http://web.mit.edu/8.02x/www)

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[web.mit.edu/8.02x/www](http://web.mit.edu/8.02x/www)

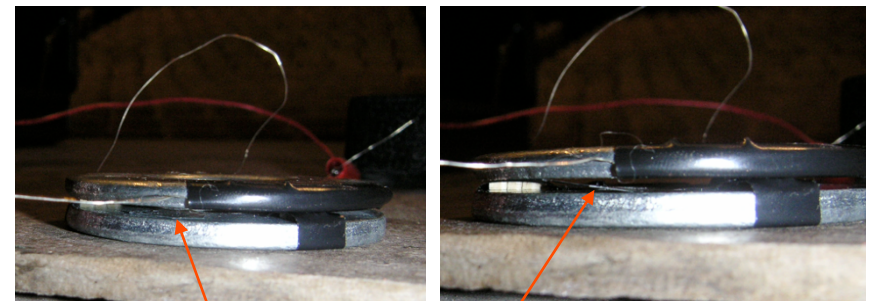
## Experiment EF



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## EF Experiment



Aluminum Foil

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