The paper picks charge up from the plate and then is repelled toward the other plate, where it picks up the opposite charge and is repelled back again.

**CE 10**  
**Force of A on B = Force of B on A**  
force pair, equal and opposite

**CE 12**  
\[ F = \frac{1}{r^2} \rightarrow \text{if } r \rightarrow \frac{1}{4} r \text{ then } F \rightarrow 16 F \]

**CE 24**  
Electrons have lowest electrical potential energy at + terminal of battery.

**CE 26**  
Most incandescent lightbulb energy goes out as heat.

**CE 28**  
Car headlights = DC (12V)  
Toaster = AC (110V, 60 Hz)

**CE 32**  
\[ \begin{align*}  
&\text{There is electric field at B} \\
&\text{There is no force at B (no charge)} \\
&\text{There is no magnetic field (no current or E charge)} \\
&\text{There is no magnetic force} \\
&\text{There is no electrical potential since no charge? (there is actually energy associated with E alone, but we haven't talked about that)}
\end{align*} \]
Faraday's Law: change in $\mathbf{B} \rightarrow$ electric field $\rightarrow$ current in loop

1. proton accelerated in opposite direction to electron
2. electron accelerates 2000 times quicker since mass 2000 times smaller than proton's

\[ F = k \frac{9.192}{r^2} \]
\[ F_{\text{He}} = k \frac{(2e)^2}{r^2} = 4 \frac{ke^2}{r^2} = 4F_H \]

\[ F_H = \frac{ke^2}{r^2} \rightarrow \text{force is 4 times stronger for the pair} \]

\[ F = 2.7 \times 10^{-4} \text{N} \]

\[ I = \frac{V}{R} = \frac{120\text{V}}{6.5\Omega} = 18.5\text{A (i)} \]
\[ I = \frac{V}{R} = \frac{1.5\text{V}}{0.02\Omega} = 75\text{A (i)} \]