Electricity

- **Voltage (V)** depends on the distance between charges.
- **Current (C)** depends on the number of moving charges.
- **Resistance (R)** depends on how much moving charges are slowed down.
Electricity

• Voltage (V) depends on the distance between charges.
Electricity

- Voltage ($V$) depends on the distance between charges.
- Current ($C$) depends on the number of moving charges.
Electricity

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Electricity

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• A formula which describes how voltage, current and resistance depend on each other is:

\[ V = C \times R \quad \text{or} \quad C = \frac{V}{R} \]
Electricity

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Example:
- If the current is \( C = 2 \) and the resistance is \( R = 100 \), how large is the voltage (V)?
Electricity

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Example:
• If the **current** is \( C = 2 \) and the **resistance** is \( R = 100 \), how large is the **voltage** (V)?
Electricity

- Simple circuit to show how current depends on voltage

**Resistance** -- tries to stop current!
**Current** -- charges flowing through wire
**Voltage** – separates charges
Electricity

- Simple circuit to show how current depends on voltage:

Table

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Electricity

Simple circuit to show how current depends on voltage:

Table

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
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</thead>
<tbody>
<tr>
<td>0.</td>
<td>0.</td>
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</tbody>
</table>
Electricity

- Simple circuit to show how current depends on voltage:

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Electricity

Simple circuit to show how current depends on voltage:

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<table>
<thead>
<tr>
<th>Voltage</th>
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</thead>
<tbody>
<tr>
<td>0.</td>
<td>0.</td>
</tr>
<tr>
<td>40.</td>
<td>185.</td>
</tr>
</tbody>
</table>
Electricity

- Simple circuit to show how current depends on voltage:

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<tbody>
<tr>
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<td>0.</td>
</tr>
<tr>
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<td>185.</td>
</tr>
<tr>
<td>80.</td>
<td>260.</td>
</tr>
</tbody>
</table>
Electricity

- Simple circuit to show how current depends on voltage:

![Simple circuit diagram]

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<td>80.</td>
<td>260.</td>
</tr>
<tr>
<td>120.</td>
<td>317.</td>
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</table>
Electricity

- Simple circuit to show how current depends on voltage:

Table

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<thead>
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<tr>
<td>0.0</td>
<td>0.0</td>
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<tr>
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<td>182.0</td>
</tr>
<tr>
<td>80.0</td>
<td>254.0</td>
</tr>
<tr>
<td>120.0</td>
<td>315.0</td>
</tr>
</tbody>
</table>
Electricity

- Simple circuit to show how current depends on voltage:

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• Series circuit of three light bulbs:

• Will bulbs be brighter or dimmer?
• What will happen if we remove one bulb?

Voltage – Pushes charges (current) through wires
Current – charges flowing through wire
Resistance tries to stop current!
Electricity

- Parallel circuit of three light bulbs:

Will bulbs be brighter or dimmer?

What will happen if we remove one bulb?

Voltage – Pushes charges (current) through wires

Current – charges flowing through wire

Resistance tries to stop current!
Electricity

• Combination circuit of three light bulbs:

  • Which bulb will shine the brightest?
  • What will happen if we remove bulb A?
  • What will happen if we remove bulb C?

Voltage – Pushes charges (current) through wires

Current – charges flowing through wire

Resistance tries to stop current!
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Van De Graaff Generator

How charge is carried up to top
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- Capacitor Boom

Capacitor

Circuit

5600 μF

on/off
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- LN2 Jumping Ring
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Summary:

- **Voltage** (V) depends on the distance between charges.
- **Current** (C) depends on the number of moving charges.
- **Resistance** (R) depends on how much moving charges are slowed down.