

Basic Electrical Engineering

ECS 203

Asst. Prof. Dr. Prapun Suksompong

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1. Basic Concepts



Office Hours:

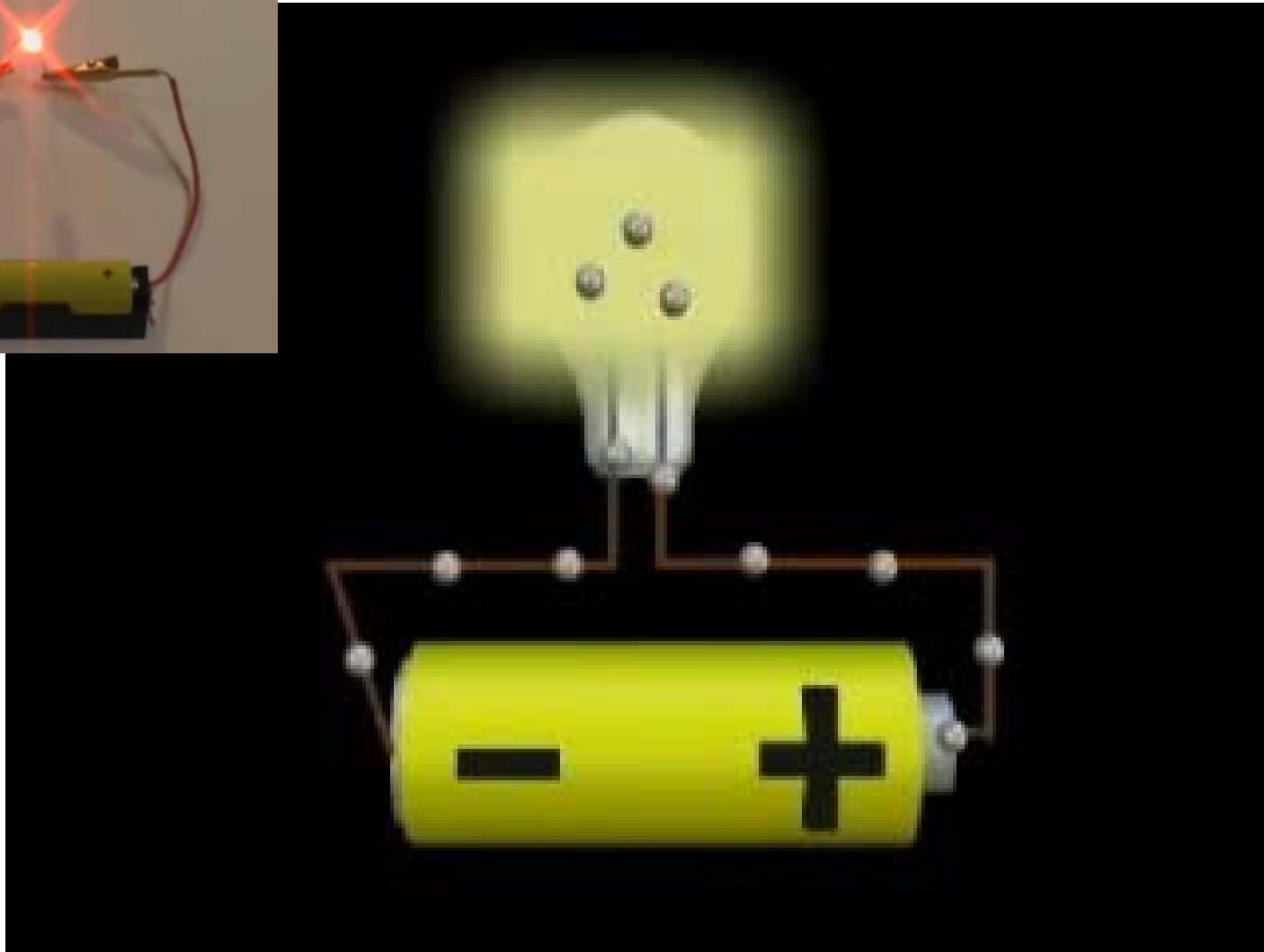
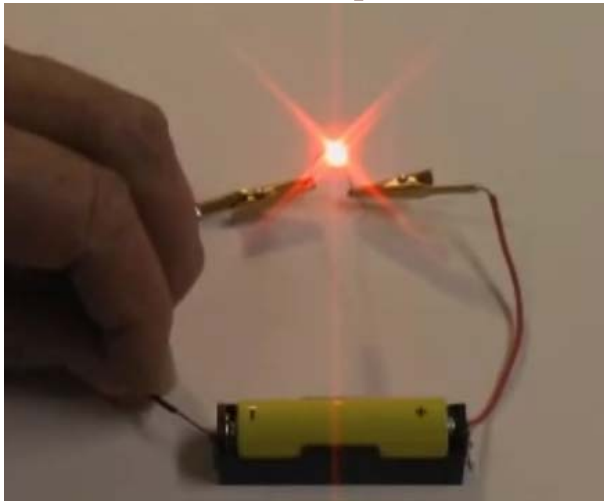
BKD, 4th floor of Sirindhralai building

Monday **14:00-16:00**

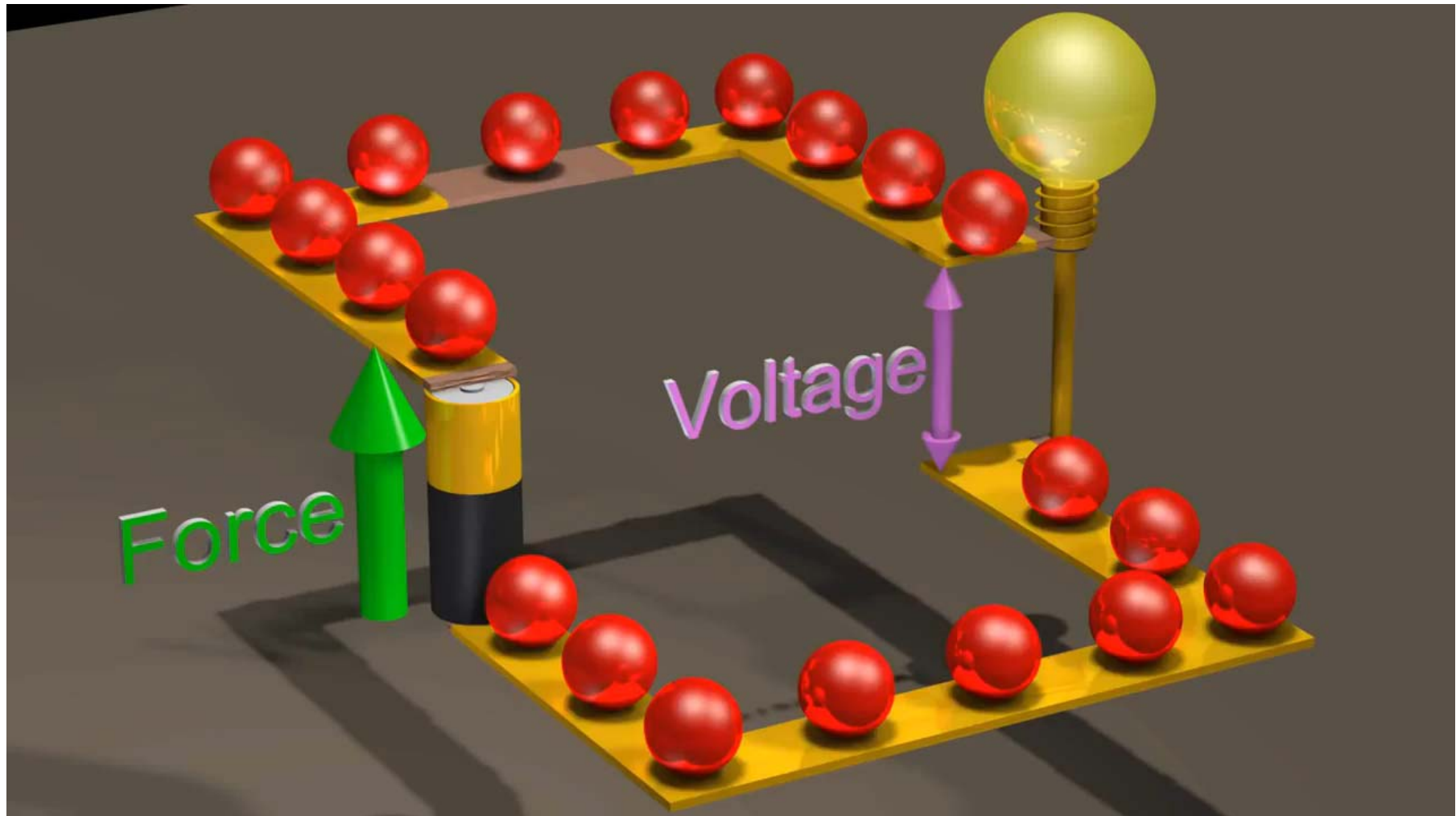
Thursday **10:30-11:30**

Friday **14:00-15:00**

Simple Circuits: Flow of Electrons



A Simple Circuit: Flow of “+” charge





Analogy: Water droplet



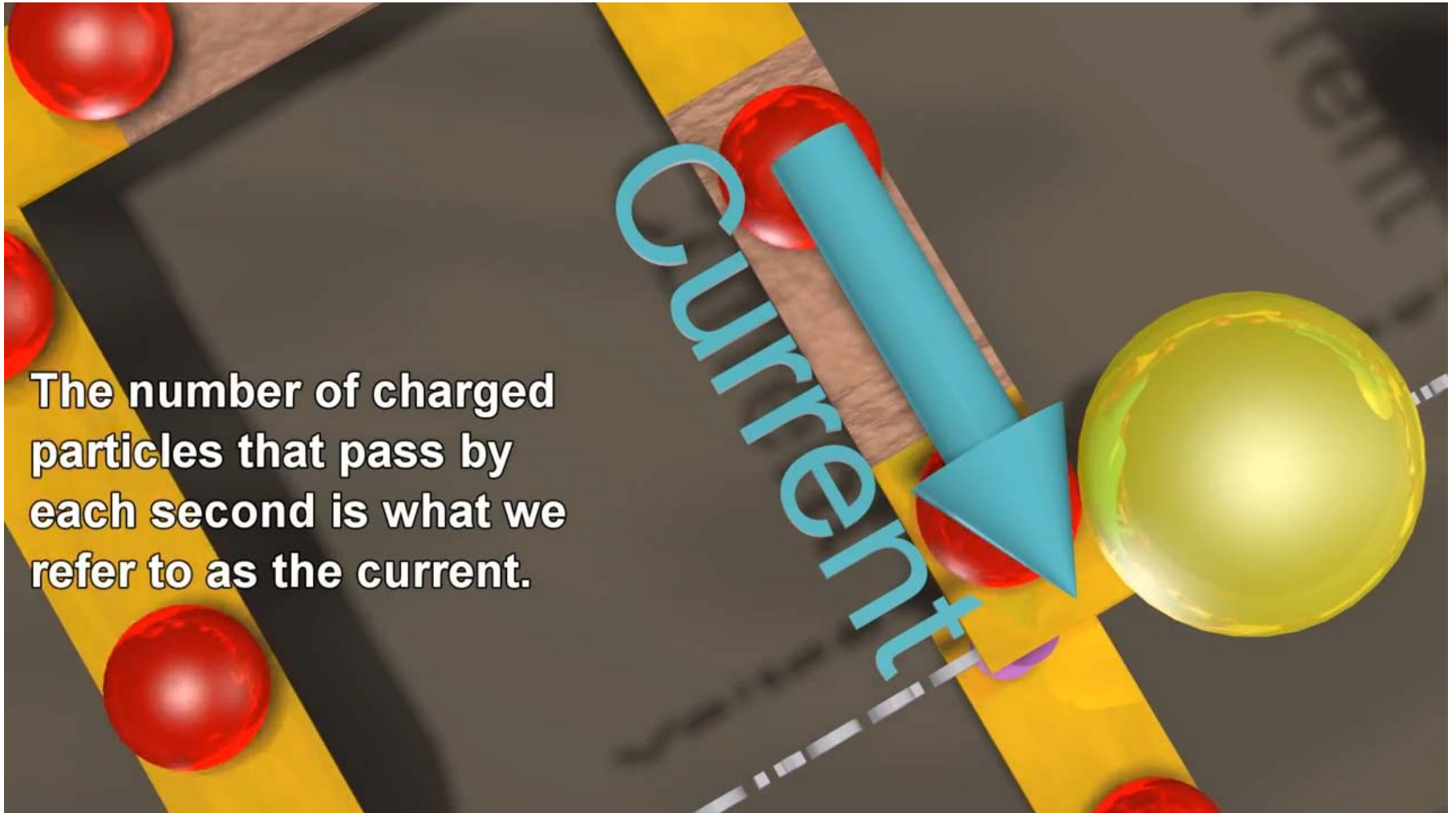
Creating Water Droplet Flow (in Oil)



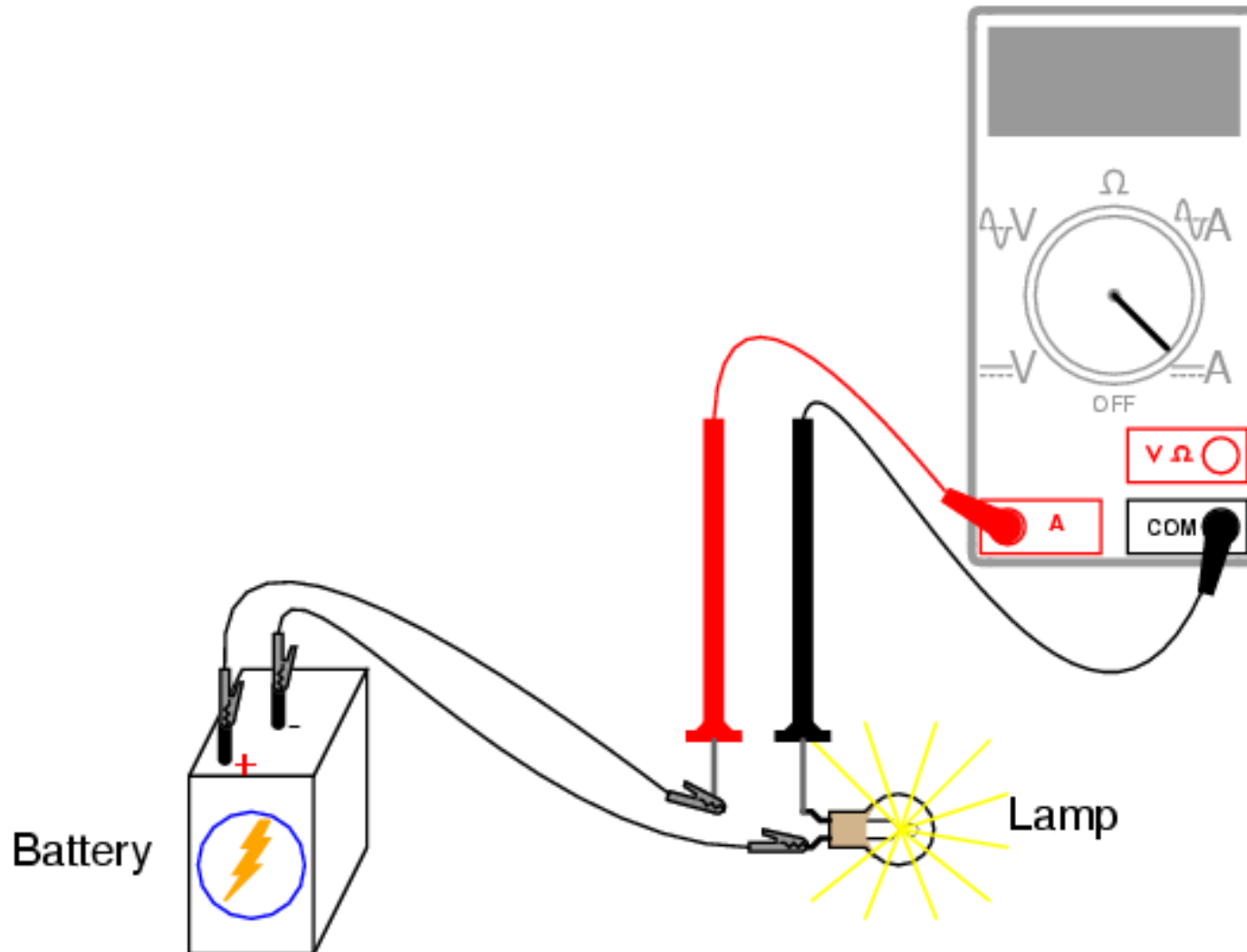
Zuma



Current



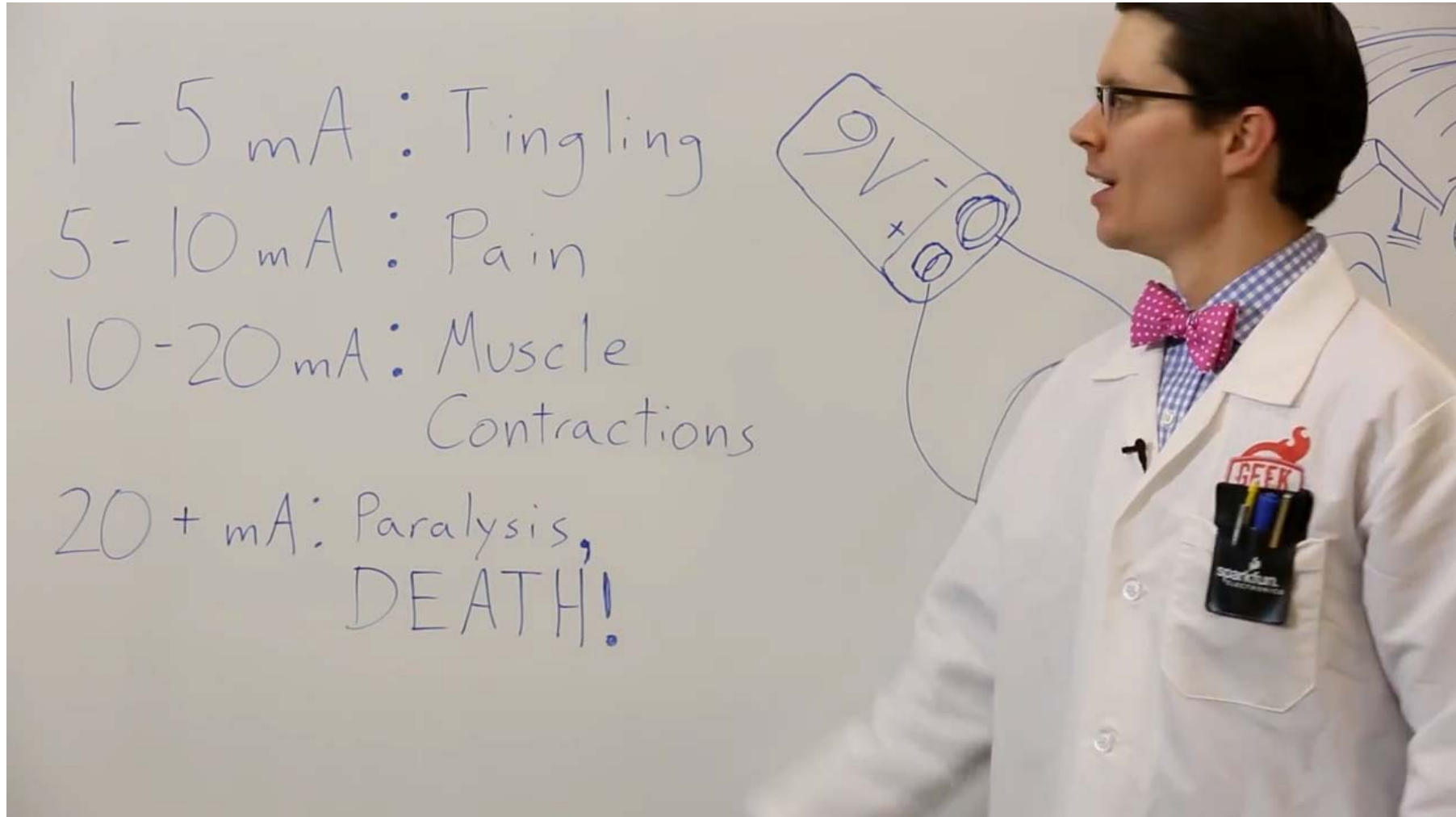
Measuring Current



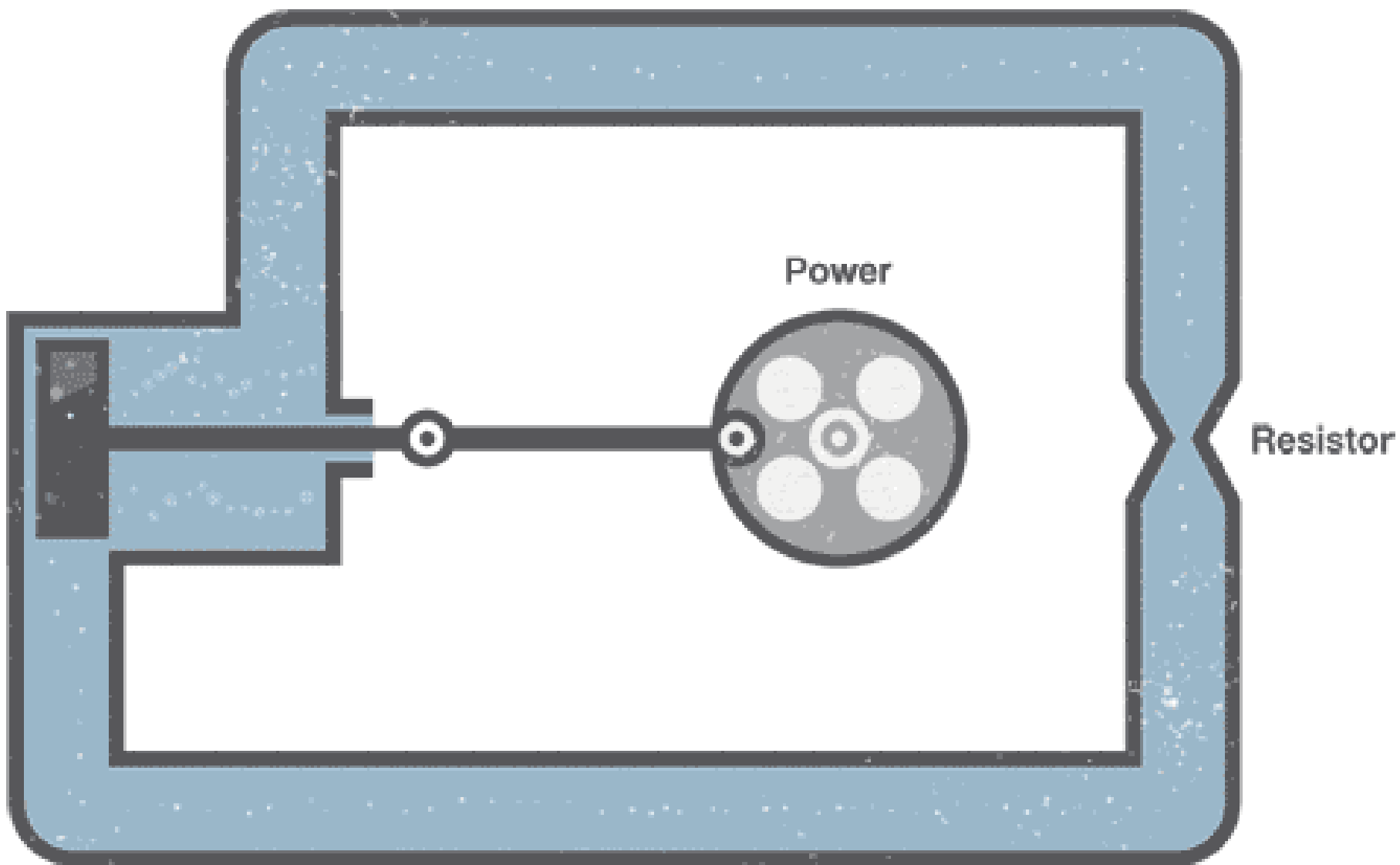
Analogy: Water meter



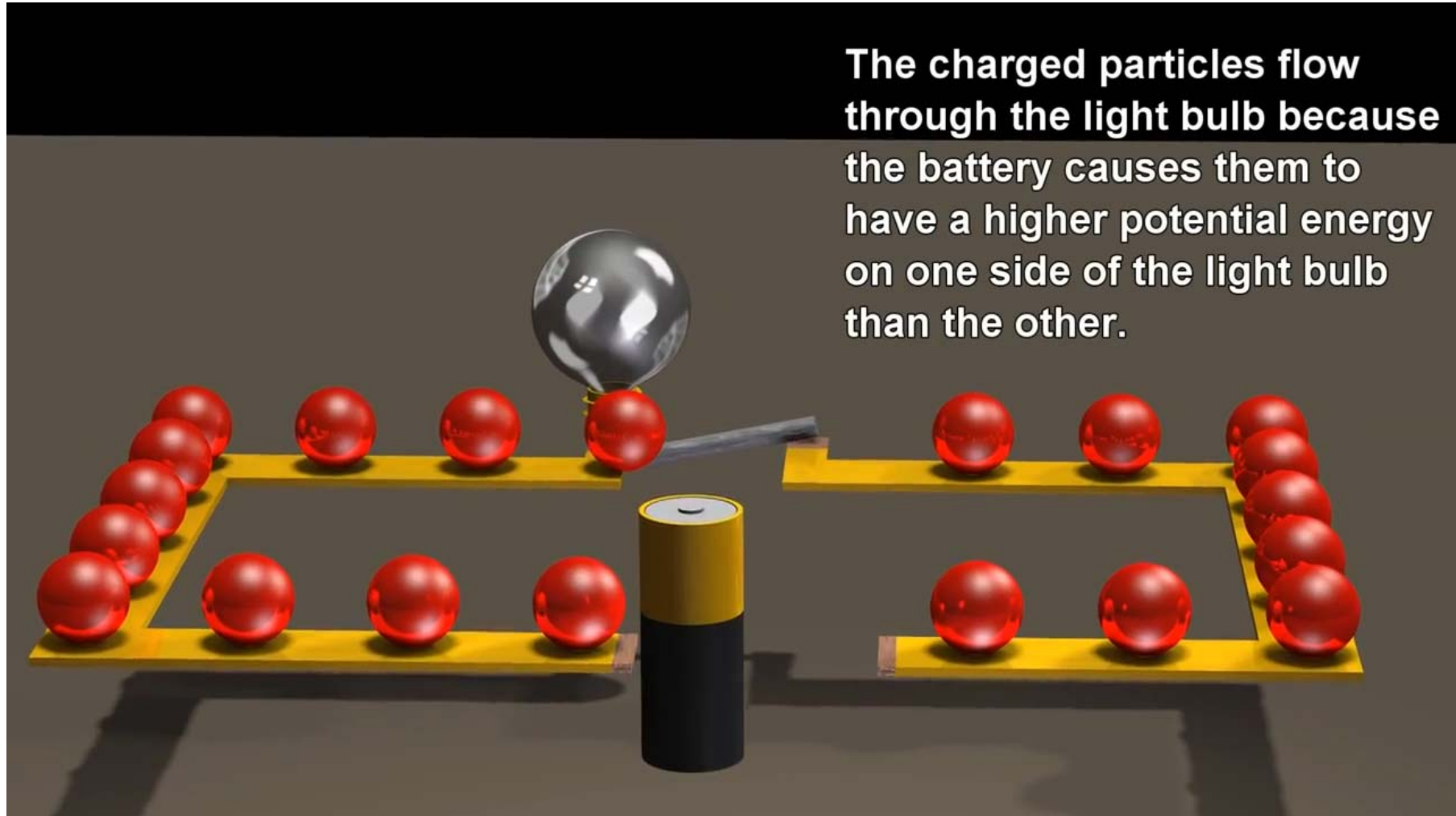
Tiny amounts of dc current can be felt and be potentially dangerous



Alternating Current: The Water Analogy

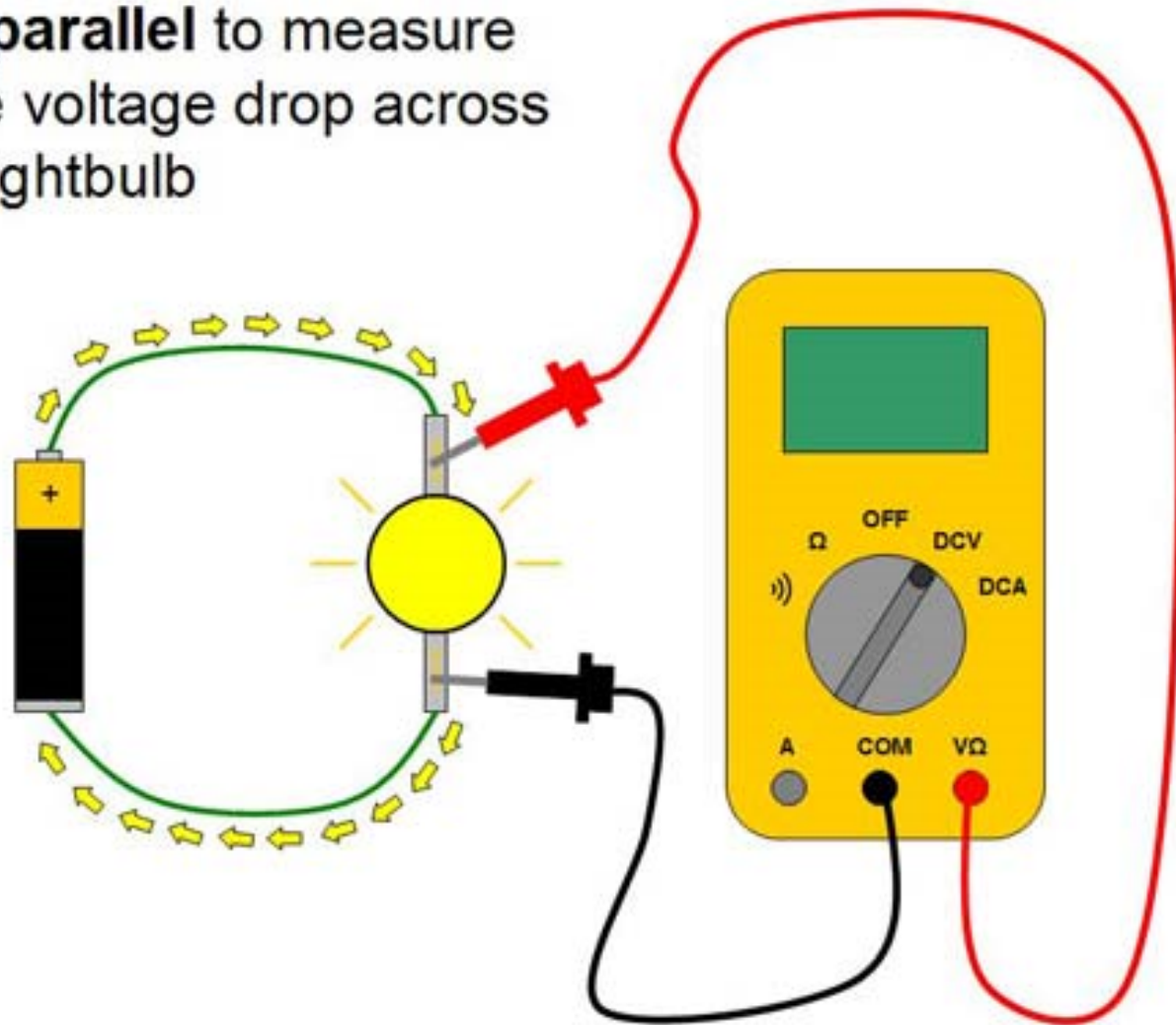


Voltage



Measuring the voltage across the bulb

Connect a multimeter in **parallel** to measure the voltage drop across a lightbulb



Analogy:

- **Voltage** is very similar to a **gravitational force**.
- Think about a **bowling ball** being dropped from a ladder into a tank of water.
- As soon as the **ball** is released, the **force of gravity** pulls it toward the bottom of the tank.
- The **potential energy** of the **bowling ball** decreases as it approaches the bottom.
- The **gravitational force** is pushing the **bowling ball** through the **water**.
- Think of the **bowling ball** as a **charge** and the **voltage** as the **force** pushing the **charge** through a circuit.
- **Charges** in motion represent a **current**, so the motion of the bowling ball could be thought of as a **current**.
- The **water** in the tank will resist the motion of the **bowling ball**. The motion of charges in an electric circuit will be impeded or resisted as well.

Four types of dependent sources

1. Voltage-controlled current source.
2. Current-controlled current source.
3. Voltage-controlled voltage source.
4. Current-controlled voltage source.

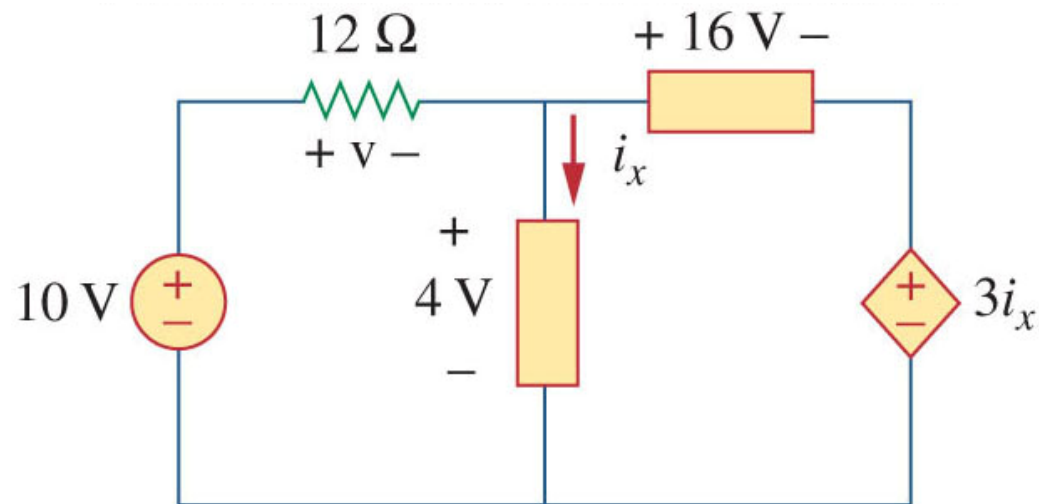


To evaluate your understanding...

Check your understanding

Indicate the type of the dependent source in the figure below.

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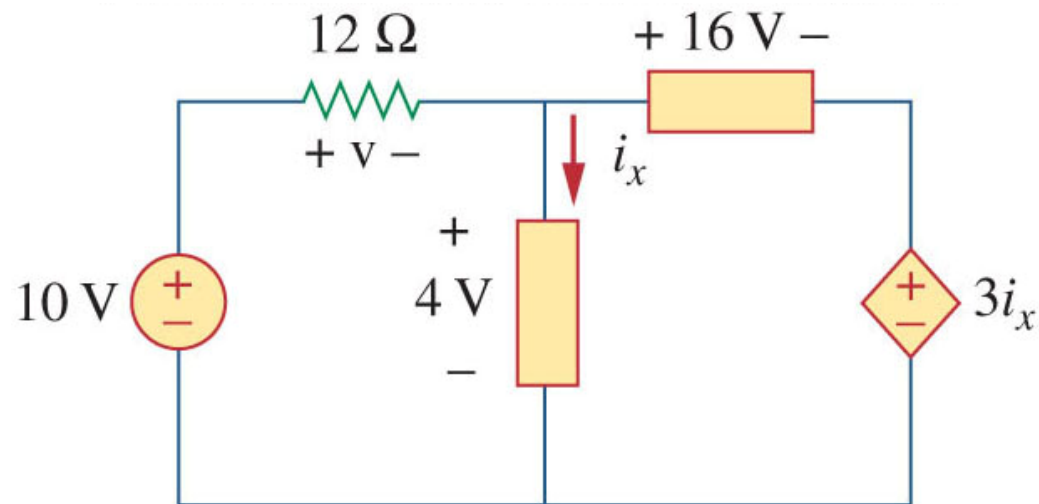


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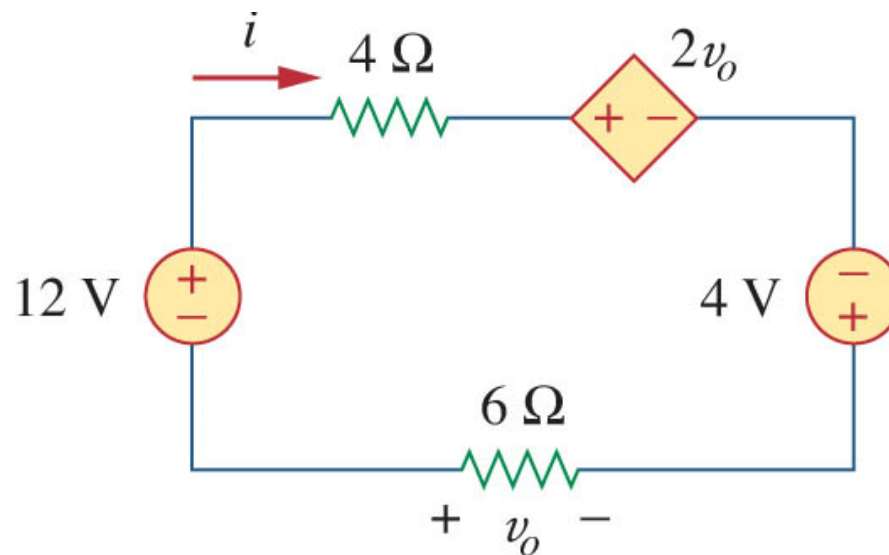


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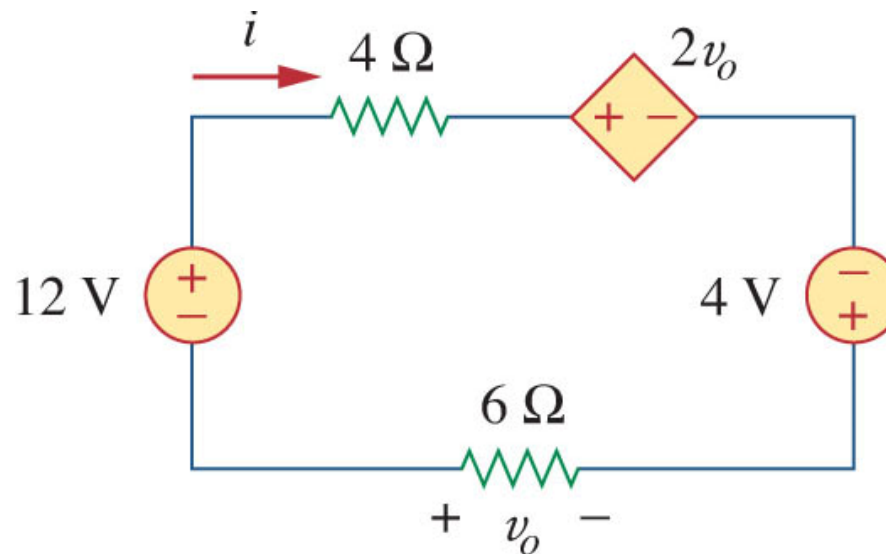


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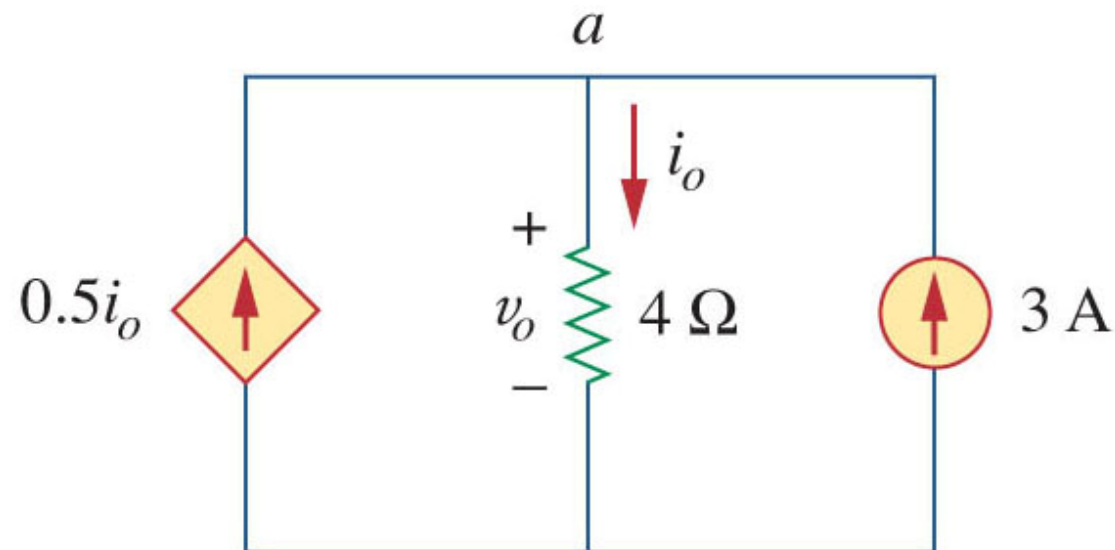


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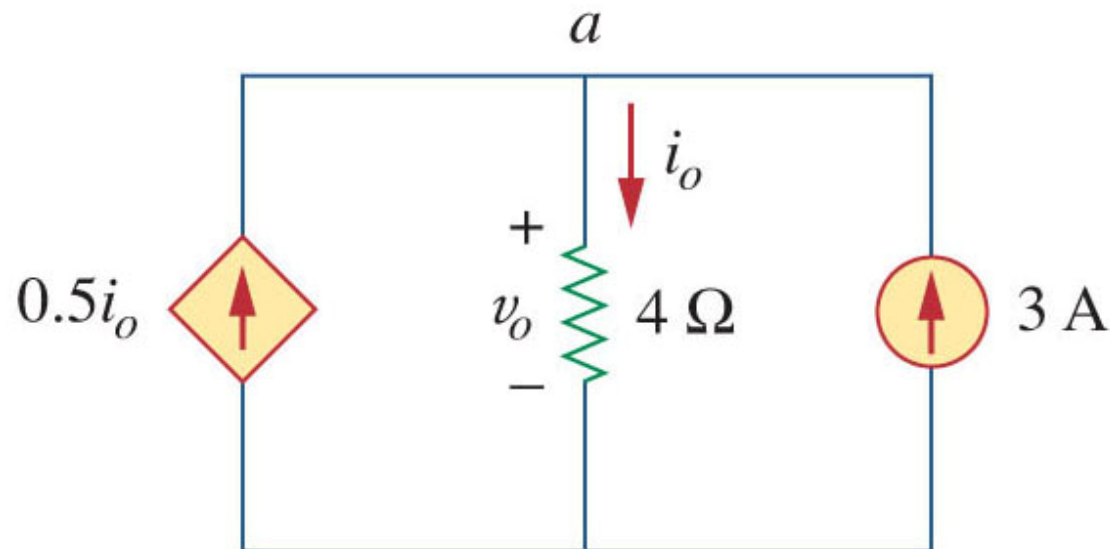


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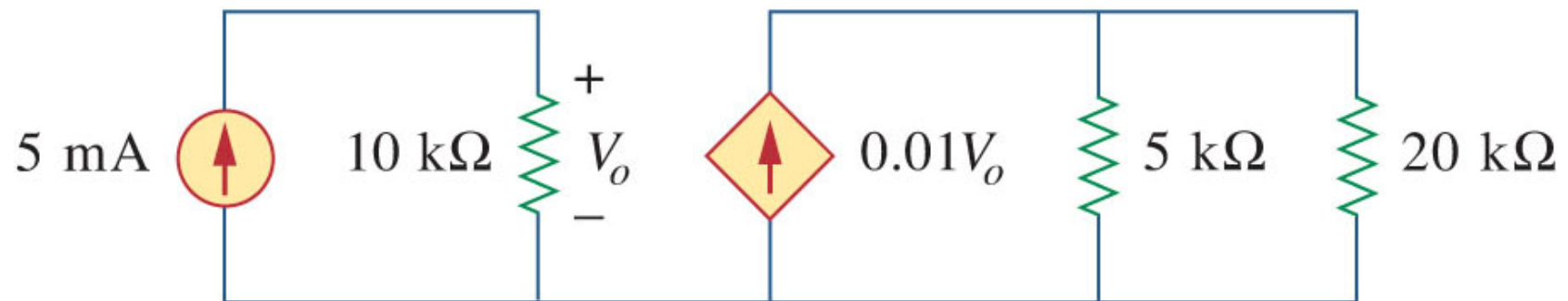


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