

Unit 5E
Current Electricity
Note-Taking Guide TEACHER

Main Ideas, Key Points, Questions:

After watching the video segment, write down key points, main ideas, and big questions.

Objective(s):

- *Understand how and why charges move in a conductor.*
- *Learn electrical circuit concepts of voltage, current, and resistance.*

Notes:

During the video segment, use words, phrases, or drawings to take notes.

Summary:

After watching the video segment, write at least three sentences explaining what you learned. You may ask yourself: "If I was going to explain this to someone else, what would I say?"

Answer the following.

1. Why do we say that electrons move in metal conductors but protons do not?

When combined in bulk matter, metal atoms form a fixed structure with each individual nucleus held in place like a lattice for growing vines. The outer electrons in each atom are like the vines, free to move across and throughout the lattice in response to electric fields.

2. What creates “pressure” in a wire, pushing charge along? (Circle one.)

- a. current
- b. resistance
- c. **voltage**

3. How does current flow in a circuit? (Circle one.)

- a. **from higher to lower potential**
- b. along an equipotential line
- c. from lower to higher potential
- d. perpendicular to the electric field

4. Electrons in a live wire move really slowly – you could easily outwalk them! But when you turn on a light switch, the bulb instantly lights up. Why?

Mobile electrons exist all throughout a current-carrying wire. Individually, they move very slowly in the direction of the electric field. However, because that field is established across the entire wire at nearly the speed of light, the electrons at the “end of the line” start moving at practically the same time as those nearby. It is the movement of the electrons close to the bulb that make it light up so quickly.

5. What causes a wire to get hot when it is conducting a charge?

Moving charges in the wire collide with each other and with the lattice structure of the bulk material. These collisions create friction, which generates heat.

6. Ohm’s law explains the relationship between what three quantities? State Ohm’s law in your own words.

voltage, current, and resistance

Ohm’s law states that the voltage in a circuit equals the total current times the circuit resistance.