Physics

Second Semester

Weeks 8 – 10

Monday / Thursday (2 -23 & 26)

- Parallel Circuits

Journal 5.1

- Who inspires you to be successful?

- T:**6D** - Analyze, design, and construct series and parallel circuits using schematics and materials such as switches, wires, resistors, lightbulbs, batteries, voltmeters, and ammeters.

6E - Calculate current through potential difference across, resistance of, and power used by electrical circuit elements connected in both series and parallel circuits using Ohm's law.

- O: I will learn about parallel circuits and how they differ from series circuits

- D: by taking notes, practicing problems with the class, and completing a worksheet.

- A: parallel circuits, current, voltage, resistance.

- Y: What are the key differences in parallel and series circuits?
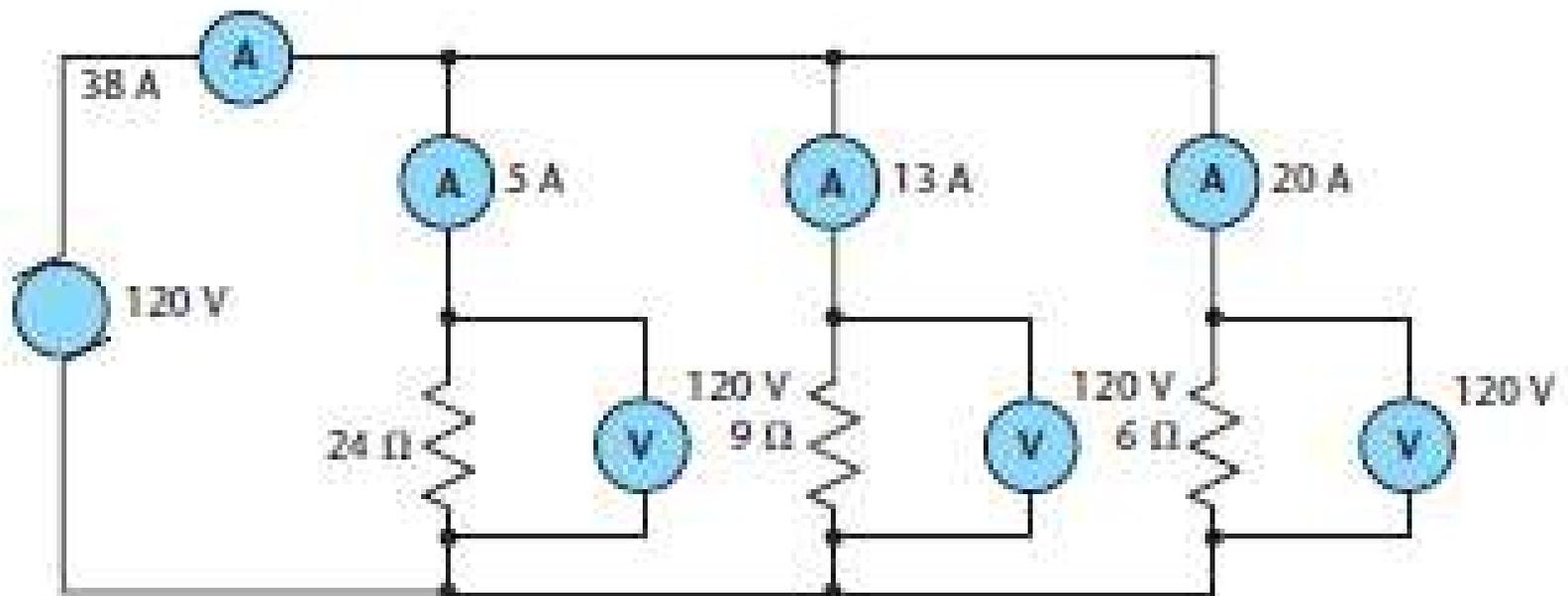
Parallel Circuits

- A circuit with several current paths
- A mountain river flowing over a waterfall while being divided into three sections
  - One large, one medium, one small
  - Sum of flows is equal to the total flow of water over the waterfall
  - Height drop is all the same

Current in Parallel Circuits

- The current through each resistor is dependent upon the resistance (pathways)
- The voltage remains the same throughout each pathway (height of the waterfall)
  - $I = V/R$
  - Total current is the sum of all currents

38 A

120 V

A 5 A

A 13 A

A 20 A

120 V
24 Ω

V

120 V
9 Ω

V

120 V
6 Ω

V

120 V

Voltage in a Parallel Circuit

- Potential difference remains the same across all of the resistors.
- Current is found by the voltage divided by the resistance
  - $I_A = V/R_A$
- The sum of currents
  - $V/R = V/R_A + V/R_B + V/R_C$

Resistance in Parallel Circuits

- The inverse of the resistances added together equals the total resistance
  - $1/R = 1/R_A + 1/R_B + 1/R_C$

Tuesday / Wednesday (2/24 & 25)

- Shutdown Days

Friday (2/27)

- C-day
- Substitute

Monday / Tuesday (3/2 & 3)

- Combined circuits worksheet

- T:**6D** - Analyze, design, and construct series and parallel circuits using schematics and materials such as switches, wires, resistors, lightbulbs, batteries, voltmeters, and ammeters.

6E - Calculate current through potential difference across, resistance of, and power used by electrical circuit elements connected in both series and parallel circuits using Ohm's law.

- O: I will demonstrate my understanding of circuits

- D: by completing a combined circuits worksheet.

- A: series circuits, parallel circuits, combined circuits, current, voltage, resistance.

- Y: How should combined circuits be treated?

Safety Devices

- Fuse- melts if too large of a current passes through
- Circuit breaker- switch that opens when current equals a set value
- Ground-Fault Interrupter- detects small changes in current and opens circuit
  - Short circuit or touching water
- Short Circuit- a large current is formed because of a low resistance

Combined Series and Parallel

- Series and Parallel circuits are joined together
    - Noticeable when electrical objects are turned on and lights dim
    - Electricity is distributed over both circuits and obey the rules of each.
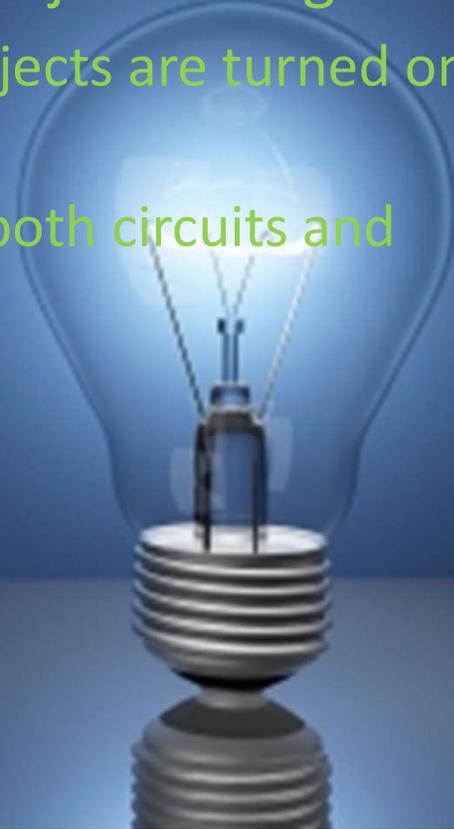
Wednesday / Thursday (March 4 & 5)

- Begin Major Grade Virtual Lab

- **T:** **(12) Science concepts. The student knows that our Sun serves as a model for stellar activity. The student is expected to:**

  - **12A** identify the approximate mass, size, motion, temperature, structure, and composition of the Sun;

- O: I will begin to learn about the sun

- D: by drawing a diagram, taking notes, and completing a close read.

- A: sun, photosphere, convection zone, radiative zone

- Y: How are the different layers of the sun arranged?

Friday (March 6)

- C-day

Monday / Tuesday (March 9 & 10)

- Finish Major Grade Virtual Lab

Wednesday / Thursday (March 11 – 12)

- DCA Circuits

Friday (March 13)

- C-day