

Unit 11 - Activity 7b

Part 1: What are the differences between the filaments of round and long bulbs?

1. Examine the round bulb filament under magnification. Describe the length, thickness and shape of the filament in the space provided:
2. Examine the long bulb filament under magnification. Describe the length, thickness and shape of the filament in the space provided:
3. How thick is the round bulb filament compared to the long bulb filament?
4. How long is the round bulb filament compared to the long bulb filament if both were uncoiled and straightened?
5. How thick are the filaments compared to the supporting wires in each bulb?

Part 2: How is air moving through straws analogous to charge moving through a filament?

Obtain a coffee straw and a soda straw and follow the instructions below.

INSTRUCTIONS: Take a deep breath and measure the time it takes to exhale through the soda straw. Now take a second, same deep breath and, using the same effort, completely exhale through the thinner coffee straw.

1. Compare the *amount of time* it takes you to completely empty your lungs by *exhaling* through each straw type.

2. Do you exhale *more air* through either straw? Explain your reasoning.

3. Repeat the previous actions, but blow onto the back of your hand. How does the speed of the air particles that strike your hand when using the soda straw compare to the speed of the air particles when using the coffee straw?

4. The same amount of air is being exhaled from your lungs through both the coffee straw and the soda straw. What does this tell you about the number particles striking the back of your hand during each second for the coffee straw compare to the soda straw?

5. Are the speeds and the number of particles per second consistent with one another?

6. Considering your answers to the preceding eight question, how would you answer the focus question: **How is air moving through straws analogous to charge moving through filaments?**