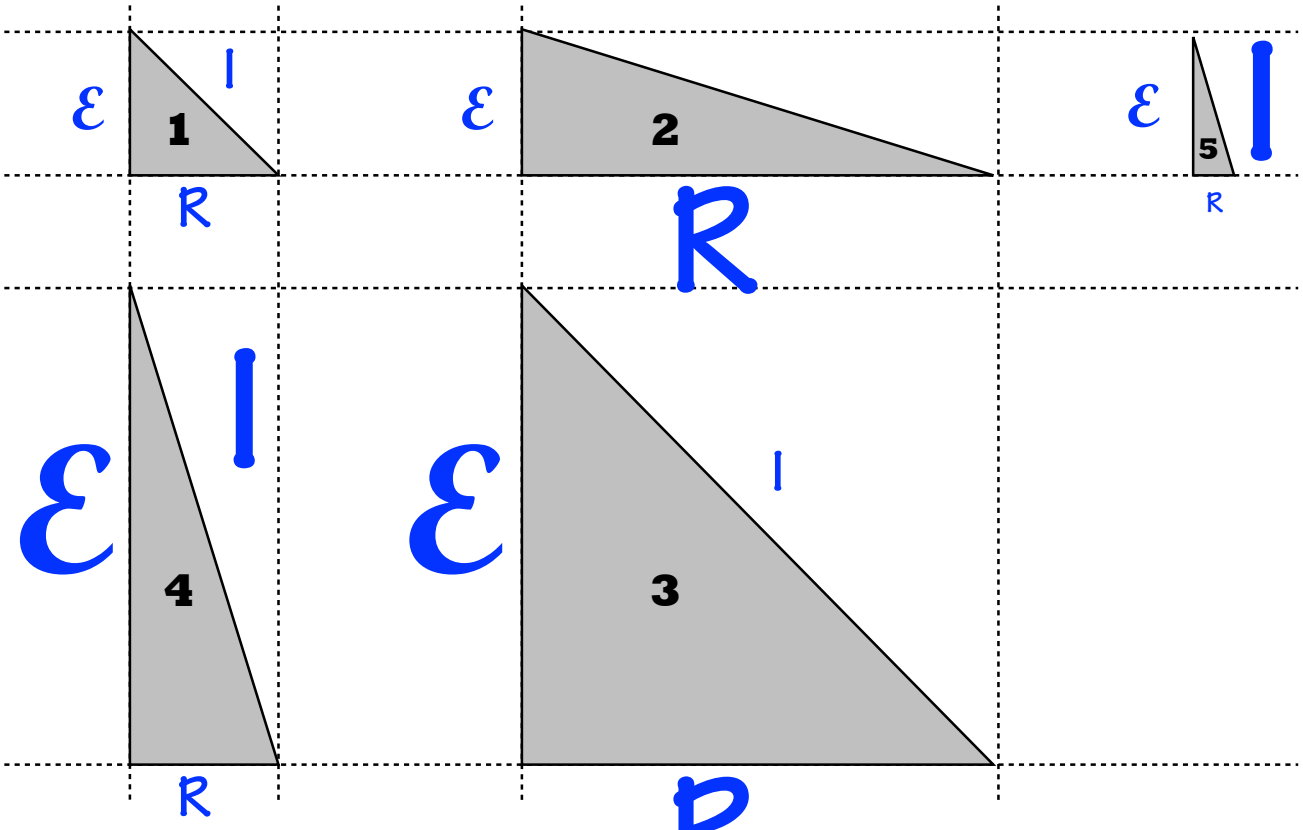
PhyzJob:
Bun-Burning and Power

Felix

I. Building a Better Bun-Burner

Which of the following slides will be the best burner? Better bun-burning involves getting the most cheeks to the highest temperature in the least time.

a. Label the parameters ($\mathcal{E}$, R, and I) of the slides below. Indicate the relative value of the parameter by the size of the letter (use a small sized R to label a short run length, etc.).



b. What parameters—$\mathcal{E}$, I, or R—do the following slides have in common?

i. Slides 1 and 2

ℰ

ii. Slides 2 and 3

R

iii. Slides 3 and 4

ℰ

iv. Slides 1 and 4

R

v. Slides 1 and 3

I

vi. Slides 4 and 5

I

c. Bun-burning championship **tournament**. Which is the better bun-burner and **why**?

i. Slide 1 *vs*. Slide 2. Circle the name of the winner and explain why it wins.

Steeper - faster

ii. Winner i*: Slide 1 *vs.* Slide 3. Circle the name of the winner and explain why it wins.

Longer

iii. Winner ii: Slide 3 *vs.* Slide 4. Circle the name of the winner and explain why it wins.

Steeper - faster

iv. Winner iii: Slide 4 *vs.* Slide 5. Circle the name of the winner and explain why it wins.

Longer

d. What characteristics does the champion bun-burning power-slide have in high quantity?

Elevation and incline

e. An equation called "Joule's Law" can be written $P = I\mathcal{E}$. Is this equation for power in an electric circuit consistent with your findings of the bun-burning power of a slide (do the best bun-burners have high elevation and incline)? If not, how does it differ?

Consistent!

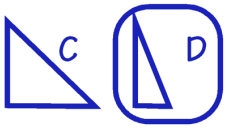
II. Use the Power of the Analogy

Draw slide diagrams to help answer the following questions.

a. Consider two circuits, A and B. Circuits A and B have equal voltages, but B has more resistance. Which circuit uses more power?

b. Consider two circuits, A and C. Circuits A and C have equal resistance, but C has more voltage. Which circuit uses more power?

c. Consider two circuits, C and D. Circuits C and D have equal voltages, but D has more current. Which circuit uses more power?



d. Consider two circuits, D and E. Circuits D and E have equal currents, but E has less resistance. Which circuit uses more power?

*The winner from contest i. Was it slide 1 or slide 2?