



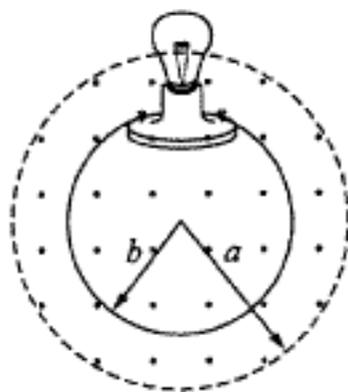
AP[®] Physics C: Electricity & Magnetism 1999 Sample Student Responses

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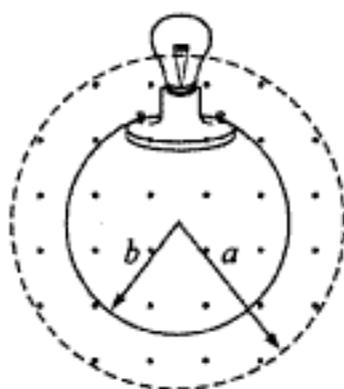
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The experiment is repeated with a loop of radius $b = 0.40$ m placed concentrically in the same magnetic field as before. The same lightbulb is connected to the loop, and the magnetic field again increases out of the page at a rate of 0.40 T/s. Neglect any direct effects of the field on the lightbulb itself.

- (d) State whether the brightness of the bulb will be greater than, less than, or equal to the brightness of the bulb in part (a). Justify your answer.

less because the emf will be less due to the smaller radius and area inside the Magnetic Field circle.



The experiment is repeated with a loop of radius $b = 0.40$ m placed concentrically in the same magnetic field as before. The same lightbulb is connected to the loop, and the magnetic field again increases out of the page at a rate of 0.40 T/s. Neglect any direct effects of the field on the lightbulb itself.

- (d) State whether the brightness of the bulb will be greater than, less than, or equal to the brightness of the bulb in part (a). Justify your answer.

Less because the emf, which varies directly with radius, would decrease