Sample Proportion and Sample Error of the Proportion

(a.k.a SEP)

Sample population-a [ ] of the population. The [ ] of elements or observations in the sample population as denoted by [ ]

Sample proportion-the [ ] of the population, based on the sample data that we have. This is often represented by $\hat{p}$, which is pronounced [ ].

$\hat{p} =$ [ ], Where p is the number of [ ] outcomes (or [ ]) and n is the [ ] [ ] (this can be a [ ], a [ ] or [ ])

Standard Error of the Proportion (SEP)

-The [ ] of the measure of the proportion of a [ ]. "How [ ] is our proportion." We want it to be as close to [ ] as possible.

The formula used to calculate the standard error of the proportion is

$$SEP = \sqrt{\frac{\square}{\square}}$$

This formula is valid when the population is at least [ ] as large as the sample. This ensures that the population is [ ] enough to estimate [ ] conclusions based on a [ ] sample.

If 540 out of 3,600 high school graduates who answer a post-graduation survey indicate that they intend to enter the military, what is the standard error of the proportion for this sample population to the nearest hundredth?

n= [ ]

p= [ ]

$$\hat{p} = \frac{p}{n}$$

$$\hat{p} = \frac{\square}{\square}$$

$$= \square$$

$$SEP = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$SEP = \sqrt{\frac{\square(1-\square)}{\square}}$$

$$= \square$$

$$= \square$$

The police chief of a small town wants to add surveillance cameras at all the traffic lights in the town to cut down on accidents. He surveyed some community members, and found that 16 out of 24 people favored the cameras. When the chief shared this data at a town council meeting, a councilwoman who works as a statistician objected to the small sample size. She said she would not vote in favor of surveillance cameras until the standard error of the proportion for the sample population is reduced to less than 0.03.

The police chief plans to conduct a new survey to fulfill the councilor's request. If the sample proportion of the new survey remains consistent with that of the first survey, how many people must be sampled in order for the councilor's request to be granted?

$$\hat{p} = \frac{16}{24} = 0.667$$

$$SEP = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$0.03 = \sqrt{\frac{0.667(1-0.667)}{n}}$$