Date Completed: _____
Mentor Initials: _____

Margin of Error

1. An analysis of a random sample of a specific model of Samsung phone batteries estimated that the mean working time was 6.7 hours with a margin of error of 0.5 hours. Which of the following is the most appropriate conclusion based on this analysis?

A) This model of phone battery has a mean working time of at least 6.7 hours.
B) This model of phone battery has a mean working time of at least 7.2 hours.
C) This model of phone battery has a mean working time of between 6.2 and 7.3 hours.
D) This model of phone battery has a mean working time of between 0.0 and 0.5 hours.

2. Two different water park owners estimated the percentage of all visitors who arrive in bathing suits. They each selected a random sample of park visitors and recorded whether the visitors entered the park wearing a suit. The results from each sample are shown in the table below.

	Percentage of visitors entering in swimsuits	Margin of error
Park A	28%	4%
Park B	28%	2%

If the associated margin of error was calculated the same way for both samples, which of the following is the most likely reason that the result for Water Park A has a larger margin of error?

A) The sample of park visitors was larger for Park A than for Park B.
B) The sample of park visitors was larger for Park B than Park A.
C) Park A had a greater number of people in swimsuits than Park B.
D) Park B had a greater number of people in swimsuits than Park A.

3. A mycologist selected a random sample of 15 butter bolete mushrooms from 10-acre region of forested mountainside and found that the mean mass of the mushrooms in the sample was 434 grams (g) with an associated margin of error of $96g$. Which of the following is the best interpretation of the ecologist's findings?

A) All mushrooms in the sample have a mass between $338g$ and $530g$.

B) Most mushrooms in this 10-acre region have a mass between $338g$ and $530g$.

C) Any mass between $338g$ and $530g$ is a plausible value for the mean mass of the mushrooms in the sample.

D) Any mass between $338g$ and $530g$ is a plausible value for the mean mass of the mushrooms in the region of mountainside.

4. A polling agency wants to test whether a ballot measure will pass with greater than the 60% yes votes required for its passage. The agency samples 1,000 registered voters selected at random and finds that 60.6% of the voters favor the ballot measure. The margin of error associated with this poll is 4%. Based on the poll's results, which of the following statements must be true?

A) The percentage of voters who will vote yes on this ballot measure is 60.6%.

B) The ballot measure will pass with more yes votes than no votes, but the percentage of votes it will receive cannot be predicted.

C) The ballot measure will receive at least 64.6% of the vote.

D) The results of the poll do not provide sufficient evidence to conclude that the ballot measure will pass.

5. A study conducted by a hybrid car company found that the average battery life of a random sample of its vehicles is 10.4 years, with an associated margin of error of 3.2 years. The study was then repeated with a much larger sample size, with the mean and margin of error of the new sample being calculated in the same way as the original study. Which of the following is most likely true?

A) The margin of error from the new study is larger than the margin of error from the original study.
B) The margin of error from the new study is smaller than the margin of error from the original study.
C) The mean from the new study is larger than the mean from the original study.
D) The mean from the new study is smaller than the mean from the original study.