#58F Ch18B Tokunaga's AP Stats Quiz Review Period: Name: _____

Confidence interval: statistic ± (critical value) • (standard deviation of statistic)

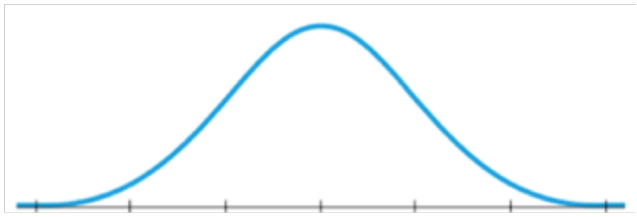
Objectives

Define the term "Standard Error".

Define the term "Confidence Interval" (CI).

W.Up

Estimate 90% of distribution from the mean on this normal model.



Coral Reef Question from last lesson.
Calculate CI for 90%.

$\hat{p} \approx \frac{54}{104}$ or 51.9%

Each confidence interval discussed in the book has a name. You'll see many different kinds of confidence intervals in the following chapters. Some will be about more than *one* sample, some will be about statistics other than *proportions*, and some will use models other than the Normal. The interval calculated and interpreted here is sometimes called a **one-proportion *z*-interval.**[4]

Use TI-Calculator to find CI of above question.

In April and May 2011, the Yale Project on Climate Change Communication and the George Mason University Center for Climate Change Communication interviewed 1010 U.S. adults about American's global warming beliefs and attitudes.[5]

QUESTION: It is standard among pollsters to use a 95% confidence level unless otherwise stated. Given that, what do these researchers mean by their confidence interval in this context?

RECAP: An April 2011 Yale/George Mason poll of 1010 U.S. adults asking questions about current topics reported a margin of error of 3%. It is a convention among pollsters to use a 95% confidence level and to report the "worst case" margin of error, based on $p = 0.5$.

QUESTION: How did the researchers calculate their margin of error?

In our sea fans example we used $2SE$ to give us a 95% confidence interval. To change the confidence level, we'd need to change the *number* of SEs so that the size of the margin of error corresponds to the new level. This number of SEs is called the **critical value.** For a 95% confidence interval, you'll find the precise critical value is $z^* = 1.96$.

RECAP: In April 2011, a Yale/George Mason poll of 1010 U.S. adults found that 40% of the respondents believed that scientists disagreed about whether global warming exists. They reported a 95% confidence interval with a margin of error of 3%.

QUESTIONS: Using the critical value of z and the standard error based on the observed proportion, what would be the margin of error for a 90% confidence interval? What's good and bad about this change?

In October 2010, the Gallup Poll[6] asked 510 randomly sampled adults the question "Generally speaking, do you believe the death penalty is applied fairly or unfairly in this country today?" Of these, 58% answered "Fairly," 36% said "Unfairly," and 7% said they didn't know. (Percentages add up to 101% due to rounding).

Question: From this survey, what can we conclude about the opinions of *all* adults?

To answer this question, we'll build a confidence interval for the proportion of all U.S. adults who believe the death penalty is applied fairly. There are four steps to building a confidence interval for proportions: Plan, Model, Mechanics, and Conclusion.