How much of the Earth is covered by water?

What proportion of the Earth is covered by water? We will investigate this question by taking a random sample of locations on the globe.

1. How many locations did your class sample? _____ How many locations were water? _____

2. Calculate the proportion of locations from your sample that are water. $\hat{p} =$ _____

3. Construct a 95% confidence interval to estimate the proportion of the Earth that is water.

STATE: State the parameter you want to estimate and the confidence level.

Parameter: _____   Confidence level: _____

PLAN: Identify the appropriate inference method and check conditions.

Name of procedure:

Check conditions:

DO: If the conditions are met, perform the calculations.

General Formula for any confidence interval:

Specific Formula for this confidence interval:

Plug numbers into the formula:

Answer:

CONCLUDE: Interpret your interval in the context of the problem.

Interpret:

The Four-Step Process (Confidence Interval for *P*)

Important Ideas:

Check Your Understanding

A company has received complaints about its customer service. The managers intend to hire a consultant to carry out a survey of customers. Before contacting the consultant, the company president wants some idea of the sample size that she will be required to pay for. One value of interest is the proportion p of customers who are satisfied with the company's customer service. She decides that she wants the estimate to be within 3 percentage points (0.03) at a 95% confidence level.

1. Using a conservative estimate for $\hat{p}$, how large of a sample is needed?

2. In the company's prior-year survey, 80% of customers surveyed said they were satisfied. Using this value as a guess for $\hat{p}$, find the sample size needed for a margin of error of at most 3 percentage points with 95% confidence. How does this compare with the required sample size from question #1?

3. What if the company president demands 99% confidence instead of 95% confidence? Would this require a smaller or larger sample size, assuming everything else remains the same? Explain your answer.