Lesson 9.1 – Significance Tests: The Basics

Important ideas:

Check Your Understanding

Calcium is a vital nutrient for healthy bones and teeth. The National Institutes of Health (NIH) recommends a calcium intake of 1300 milligrams (mg) per day for teenagers. The NIH is concerned that teenagers are not getting enough calcium, on average. Is this true?

1. State appropriate hypotheses for performing a significance test. Be sure to define the parameter of interest.

Researchers decide to perform a test using the hypotheses stated in #1. They ask a random sample of 20 teens to record their food and drink consumption for 1 day. The researchers then compute the calcium intake for each student. Data analysis reveals that $\overbar{x}$ = 1198 mg and $s\_{x}$ = 411 mg. Researchers performed a significance test and obtained a P-value of 0.1404.

1. Explain what it would mean for the null hypothesis to be true in this setting.
2. Interpret the P-value.
3. What conclusion would you make at the α = 0.05 level?

**Phillies Fanatics**

Nationally, the proportion of red cars on the road is 0.12. A statistically

minded fan of the Philadelphia Phillies (whose team color is red) wonders if Phillies fans are more likely to drive red cars. One day during a home game, he takes a random sample of 210 cars parked at Citizens Bank Park (the Phillies home field), and counts 35 red cars.

(a) State appropriate hypotheses for performing a significance test. Be sure to define the parameter of interest.

(b) The P-value for the test in (a) is 0.0187. Interpret the P-value in context.

(c) What conclusion would you make?