Unit 4, Module 13: Assessing the Fit of a Line

**Learning Goal:** Use residuals, standard error and *r*2 to assess the fit of a linear model.

In this activity you will practice pulling together what you have learned in Topic 3.3. You will use residuals, se and *r*2 to analyze how well the regression line fits the data.

1. Researchers took body measurements for 136 children at ages 2, 9, and 18. The children were born in 1928-29 in Berkeley CA. Here we investigate the relationship between height at age 2 and height at age 18.

**Simple linear regression results:**

Dependent Variable: Height\_18

Independent Variable: Height\_2

Height\_18 = 45.797 + 1.444 Height\_2

Sample size: 136

R (correlation coefficient) = 0.5486734

R-sq = 0.3010425
Estimate of error standard deviation: 7.4216731

1. In this analysis, what is the explanatory variable? Why does this make sense?
2. Do taller 2-year-olds also tend to be taller 18-year-olds? Support your answer.
3. Is the association between heights at age 2 and age 18 strong or weak? Support your answer.
4. Use the context of the problem to describe what the standard error tells us in this situation.
5. Use the context of the problem to describe what the R-sq value tells us in this situation.