

ACT Scores

ACT Average Composite Scores by State, 2004-05 (source: *The World Almanac and Book of Facts, 2006*)

Average Composite scores and percent of high school graduates taking the ACT:

State	Score	%	State	Score	%
Alabama	20.2	77	Montana	21.8	57
Alaska	21.3	26	Nebraska	21.8	76
Arizona	21.5	19	Nevada	21.5	28
Arkansas	20.3	76	New Hampshire	22.3	10
California	21.6	14	New Jersey	21.3	6
Colorado	20.2	100	New Mexico	20.0	61
Connecticut	22.8	10	New York	22.4	17
Delaware	20.8	4	North Carolina	20.2	15
Florida	20.4	41	North Dakota	21.3	82
Georgia	20.0	29	Ohio	21.4	66
Hawaii	21.9	16	Oklahoma	20.4	69
Idaho	21.3	58	Oregon	22.6	12
Illinois	20.3	100	Pennsylvania	21.7	9
Indiana	21.7	21	Rhode Island	21.9	8
Iowa	22.0	66	South Carolina	19.4	38
Kansas	21.7	76	South Dakota	21.5	76
Kentucky	20.4	76	Tennessee	20.5	92
Louisiana	19.8	85	Texas	20.2	29
Maine	22.4	10	Utah	21.5	68
Maryland	21.0	12	Vermont	22.6	16
Massachusetts	22.8	12	Virginia	20.8	14
Michigan	21.4	69	Washington	22.7	16
Minnesota	22.3	68	West Virginia	20.4	65
Mississippi	18.7	94	Wisconsin	22.2	69
Missouri	21.6	70	Wyoming	21.4	69

- a. Enter the data on ACT scores into a list (or load the tns file into your Nspire). Make appropriate graphs to display the data. You may want to adjust the bin settings and window for the histogram. Add normalPdf to your histogram. Discuss the advantages and disadvantages to the different graphs.
- b. Find the mean and standard deviation and the median and IQR of ACT Scores. Which measures of center and spread are appropriate to use for this data set?
- c. Use the information from parts *a* and *b* to describe the distribution of average composite ACT scores.

- d. Make a scatterplot of ACT Scores vs % of graduates taking the ACT. Describe the relationship.
- e. Find and interpret the correlation coefficient, the coefficient of determination and the equation of the least-squares regression line. Plot the line on the scatterplot.
- f. Plot the % of graduates vs the residuals (either as a separate graph or as part of scatterplot display). What does this residual plot show?
- g. Is there a significant linear relationship between average composite ACT scores and the percent of graduates who took the ACT? Support your answer with the appropriate test of significance.