Data Science for All, 1e ©2026

Standards	Objectives	Breakouts	Pg No	Topic	
Standard I: Students will understand, use, and evaluate random processes underlying statistical analysis.	Objective 1: Use sample survey data collected through random samples to draw conclusions about populations.	a. Recognize sources of bias C4:C38d discuss how surveys may be intentionally biased to support certain agendas.	299	Sampling Techniques	
		b. Explain the importance of randomness in good survey design.	284	Random Sampling	
		c. Pose a question, choose an appropriate method of random selection, conduct a survey, and summarize the results in graphical displays.	284 - 286	Random Sampling Table 6.4	
		d. Distinguish between different survey designs such as SRS, cluster sampling, stratified sampling, and systematic sampling.	285	Stratified Random Sampling	
	Objective 2: Describe and use the features of good experimental design, such as random assignment of treatments, controls, placebos, blinding, and blocking.	a. Distinguish between an observational study and an experiment and be able to select which method is appropriate to collect desired information.	300 314 329	Q35 and Q36 The Scientific Method 4. Section 7.5: Drawing Conclusions in an Observational Study	
		b. Recognize possible sources of bias in various experiments, and describe how the features of good experimental design will reduce bias.	50	Case Study: Data Wrangling in Criminal Justice Research	
		c. Pose a question, conduct one or more simple experiments using appropriate features of experimental design for the data that is being collected, and summarize the results in graphical displays.	315 349 351	Section 7.2: Data Collection and Study Design Chapter 7: Putting It Together Q57	
		d. Explain the importance of experimental ethics, and debate historical violations of experimental ethics.	NA	NA	

	Objective 3: Discuss and interpret surveys, experiments, and observations using information from government data, current events, medical experiments, polls, and news media.	a. Consider the reasonableness of claims of data from various sources, using examples to illustrate the uses and misuses of statistics that appear in the media.	192	Try It Yourself: Plot Correlations between Two Quantitative Variables	
		b. Distinguish between causality and correlation, and be able to recognize unwarranted conclusions.	318	Case Study: Firearm Regulations and Causation versus Correlation	
		c. Recognize when data is misrepresented by graphical manipulation, such as modified axes or use of incorrect visual proportions.	129	Section 3.6: The Dangers of Visual Misrepresentation	
		d. Discuss the role of government reports such as the consumer price index for making comparisons in data.	NA	NA	
		e. Calculate percent change and perform simple calculations for price changes over the years due to inflation.	NA	NA	
Standard II: Students will summarize and interpret data.	Objective 1: Interpret and display data by selecting appropriate graphical methods.	a. Distinguish between quantitative and categorical data.	194	Quantitative-by-Categorical Relationships	
		b. Use quantitative data to create dot plots, stem plots, histograms, box plots, and scatter plots and use them to make sense of the data.	145-151 196	Figure 3.61 Figure 3.62 Figure 3.72 Match Box Plots with Histograms	
		c. Use categorical data to create circle graphs, bar graphs and frequency tables and use them to make sense of the data.	198	Categorical-by-Categorical Relationships	
	Objective 2: Summarize data and be able to use technology such as calculators or	a. Calculate measures of center, and estimate center from data presented in a variety of forms, such as charts, tables, and graphs.	177-179	Section 4.1: Central Tendency	
		b. Select and interpret appropriate measures of spread.	196	Try It Yourself: Match Box Plots with Histograms	

		c. Describe the distribution of data considering shape, skewness, modality, and outliers.	156	Activity: Describe a Density Plot Q1.	
	Objective 3: Use data summaries to interpret and compare data.	a. Describe and compare individual performances in terms of quartiles, percentiles and standard deviations.	201 206	Percentiles Determine Outliers Using the Quartile and Mean/SD Methods	
		b. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of outliers.	195	Try It Yourself: Match Box Plots with Histograms 1, 2, 3	
		c. Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets.	205	The Impact of Outliers on Data Interpretation	
	Objective 4: Describe the characteristics of the normal distribution, and create an understanding of the standard deviation as a measure of spread.	a. Examine data sets that approximate the normal distribution, and recognize the characteristics of data that are normally distributed.	292 344	Figure 6.18 Figure 7.20	
		b. Compare individual measurements using the mean and standard deviation to find standardized scores and identify unusual data points.	465	DEFINITION - Standardized score Try It Yourself: Detect Anomalies Q1.	
		c. Use the 68%–95%–99.7% rule to determine the probability of events.	NA	NA	
		d. Use the 68%–95%–99.7% rule to create and explain confidence intervals.	NA	NA	
Standard III: Students will make inferences and justify conclusions based on data.	Objective 1: Summarize, represent, and interpret bivariate data.	a. Create and use graphs of bivariate data to visually assess trends and recognize patterns.	108	Section 3.4: Visualizations with Two Variables	
		b. Calculate regression lines and correlation coefficients for linear data using technology such as calculators or computer software.	420	Case Study: Anesthesia and Regression	

		c. Use regression equations to make appropriate predictions.	423	Section 9.4: Multiple Linear Regression Table 9.3	
		d. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	425 443	Exploring R-Squared in Multiple Linear Regression Activity: Compute a Correlation and Fit a Regression Line Q2.	
		e. Make predictions based on patterns and trends of non-linear data, such as seasonal data, tidal tables, sunspots, and population changes.	376	Inference versus Prediction Q3	
	Objective 2: Display and compare data to make predictions and formulate conclusions.	a. Describe the effect of outliers on predictions.	206	The Impact of Outliers on Data Interpretation	
		b. Recognize and discuss the pitfalls of extrapolation in predictions.	438	Ethics in Practice: Extrapolation	This is Partially aligned.
		c. Compare actual data measurements with predicted values, and discuss the reasonableness of predictions.	283	Case Study: FiveThirtyEight	
	Objective 3: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	a. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	279	Section 6.2: Probability	
		b. Understand and interpret confidence intervals generated from data.	NA	NA	
		c. Use the results of hypothesis testing to interpret sample data and draw conclusions.	329	High School Study: Inference for a ProportionHazel and Everett's First Research Question	

Standard IV: Students will understand and use probability rules.	Objective 1: Use the rules of probability to calculate independent and conditional probabilities in real contexts.	a. Distinguish between subjective, experimental, and theoretical probability.	341-343	The A/B Testing Phases	
		b. Calculate probabilities using addition and multiplication rules, tree diagrams, and twoway tables using correct probability notation.	NA	NA	
	Objective 1: Use the rules of probability to calculate independent and conditional probabilities in real contexts.	a. Distinguish between subjective, experimental, and theoretical probability.	294	The Law of Averages and the Gambler's Fallacy	
		b. Calculate probabilities using addition and multiplication rules, tree diagrams, and twoway tables using correct probability notation.	NA	NA	
		c. Calculate conditional probabilities of compound events using twoway tables and Venn diagrams.	297	Confusion of the Inverse Table 6.9	
		d. Use permutations and combinations to find probabilities.	NA	NA	
	Objective 2: Adapt probability models to solve real-world problems.	a. Perform simulations to estimate probability outcomes using technology and objects such as coins, spinners, cards, and dice.	319	Simulation-Based Inference: The Scientific Method for a Coin Toss Experiment	
		b. Identify and explain common misconceptions regarding probability, including long-run vs. short-run behavior.	319	Analyze the Data of a Coin Toss	
		c. Discuss probability applications in decision making, using terms such as "odds" and "risk," including applications in insurance, medical treatments, and extreme sports.	297	Table 6.9	
	Objective 3: Use probability to make decisions and analyze outcomes.	a. Calculate expected values and use them to solve problems.	323	Interpret the Data and Draw Conclusions about the Coin Toss	
		b. Develop a probability distribution for a random variable and find the expected value.	321	Figure 7.6	

| | | c. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. | 322 | Try It Yourself: Estimate the Probability of an Event | This is Partially aligned. |
| | | d. Use probabilities to make fair decisions. | 279 | Section 6.2: Probability | |