Statistics: Chapter 7 Solutions

Lesson 7.1.1

7-1.   a.   Values vary.

      b.   This will generally be a unimodal graph, with a mean near the true proportion (≈ 0.24 if using M&Ms) and a standard deviation of about 0.10 chocolates. See example graph at right.

Proportions of blue chocolates

      c.   Using the dot plot provided, the middle 90% are between 0.10 and 0.40 blue candies.

      d.   Using the provided dot plot, the middle 90% interval for the proportion of blue candy-coated chocolates in a single bag is 0.25 ± 0.15.
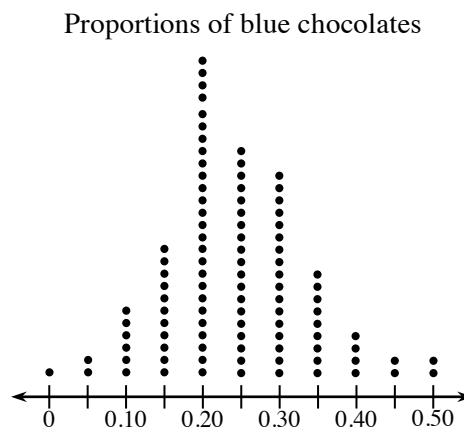
      e.   Using the provided dot plot, the probability is about $\frac{2}{100}$ or 2%. Sorry Abigail!

7-2.   a.   0.25

Handedness

      b.   categorical

      c.   Since this is a categorical variable, the best graphical display is a bar chart, as shown at right, though a circle graph could work as well.

      d.   This is another bar chart like the one above, but the height of the "right" bar should be 2 and the "left" bar should be 0.
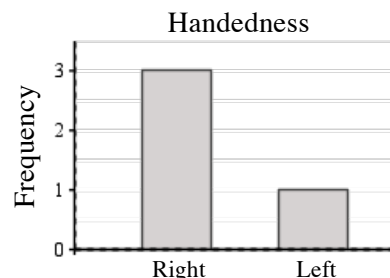
      e.   J, S: 0; J, L: 0; J, M: 0.5; S, L: 0; S, M: 0.5; L, M: 0.5

Sampling Distribution of $\hat{p}$

      f.   See dot plot at right for an example display. The mean value is 0.25 students, even though no single sample gives that value.
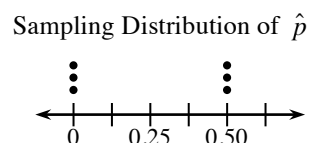
      g.   Every sample is a distance of 0.25 students away from the true value, so the variability could reasonably be described as 0.25 students in either direction.

7-3.   Following the model of problem 7-1, Caitlin could use a directory and random generator to randomly select many different samples of 5 students and record how many of them are in Statistics. Once she repeats this enough times, she can calculate the approximate probability by calculating the proportion of how many of her samples had 3 or more Statistics students.

 Statistics

7-4.   a.   Bar graph: red $= 1$, orange $= 2$, pink $= 2$. Could also be a circle graph.

       b.   O1, O2, R; O1, O2, P1; O1, O2, P2; O1, R, P1; O1, R, P2; O1, P1, P2; O2, R, P1; O2, R, P2; O2, P1, P2; R, P1, P2

       c.   Bar graph or circle graph, very simple.

       d.
Number of
pink candies
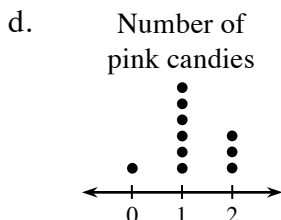
       e.   No. The mean of the sampling distribution is clearly not 2, which is the population value.

7-5.   a.   5% to 11%

       b.   About $8 \pm 3\%$ defective flashlights

7-6.   a.

Soda per Bottle (oz)
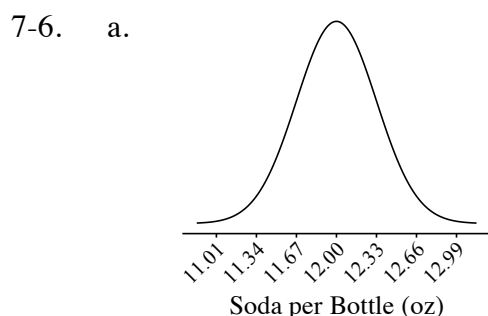
       b. $P(X > 12) = 50\%$

       c.   See graph in part (a). $P(11.5 < X < 12.5) =$ normalcdf$(11.5, 12.5, 12, 0.33) = 87\%$

       d.   invNorm$(0.04, 12, 0.33) = 11.42$ oz, the lower bound. $12 - 11.42 = 0.58$, so by symmetry, the other half must be 0.58 ounces above the mean, so the upper bound is 12.58 oz. (Or invNorm$(0.96, 12, 0.33) = 12.58$ oz.)

7-7. P(both) $= 31.5\%$, P(neither) $= 16.5\%$. See table at right.

		Widow's Peak	
		yes 0.70	no 0.30
Dimples	yes 0.45	0.315	
	no 0.55		0.165