

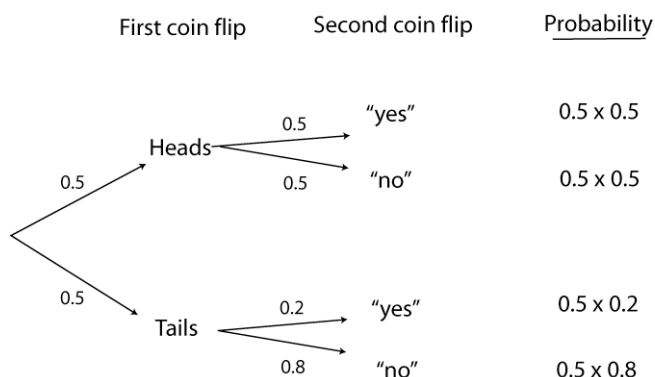
## BIOL 300 Assignment 3, Spring 2012

### Chapter 4

8. (a)  $SE = 6.7 / \sqrt{4620} = 0.10$ . In women,  $4.6 / \sqrt{6228} = 0.06$ .  
(b) Standard deviation, because it describes the spread of the distribution of the variable itself. In contrast, the standard error describes the spread of the sampling distribution of the sample mean.  
(c) The standard error, because it describes the spread of the distribution of sample means. If the standard error is small, then the sample mean is likely close to the population mean (low uncertainty).
9. (a) False.  
(b) True.  
(c) True.  
(d) True.
10. No (the true mean and the sample confidence limits are all constants, so there is no probability involved). The correct interpretation is that in 95% of random samples, the 95% confidence interval calculated will contain the population mean.

### Chapter 5

17. (a) No, some plants are tall with green pods, so "tall" and "green pods" are not mutually exclusive.  
(b)  $1200/1600$  were tall,  $1200/1600$  were green. If independent,  $\Pr[\text{tall and green}] = \Pr[\text{tall}] \times \Pr[\text{green}] = 3/4 \times 3/4 = 9/16$ , or 900 out of 1600. There were 900 out of 1600, so it appears that green and tall are independent.
21. (a)



(b)  $\Pr[\text{"Yes"}] = (0.5 \times 0.5) + (0.5 \times 0.2) = 0.35$

26. (a)  $\Pr[\text{drawn pebble is white}] = 2/5$

- (b)  $\Pr[\text{drawn pebble is white} \mid \text{first drawn is black}] = 1/2$
- (c)  $\Pr[\text{three draws with replacement are white}] = 0.4^3 = 0.064$
- (d)  $\Pr[\text{three sequential draws without replacement white}] = 0$  (there are only two white pebbles in the bag!)
- (e) Drawing with replacement means that each event is independent. This is not true when drawing without replacement.