Chapter 11 Gifted and Enrichment Answers

1. Assuming that any letter's code could be the letter itself, then there are 26 possible letters for each of the 6 letters in the word, that is, 26 × 26 × 26 × 26 × 26 × 26 = 308 915 776 possible combinations.
Assuming any letter's code could not be itself, then there are 25 possible letters for each of the 6 letters in the word, that is, 25 × 25 × 25 × 25 × 25 × 25 = 244 140 625 possible combinations.

2. There are 4 suits; so you have a 1 in 4 chance of guessing the suit correctly. Ace, Jack, Queen, and King are the 4 non-number cards out of 13 cards in each suit. So, you have a 4 in 13 chance of guessing if the card is a non-number card correctly. 1 in 4 is 0.25 and 4 in 13 is approximately 0.31. So, 1 in 4 is less than 4 in 13; it is more difficult to guess the suit. Guessing the suit and guessing if the card is a non-number card are independent events, so the probability of guessing both correctly is $\frac{1}{4} \times \frac{4}{13} = \frac{1}{13}$.

3. a) Systematically list all the different possible outcomes.

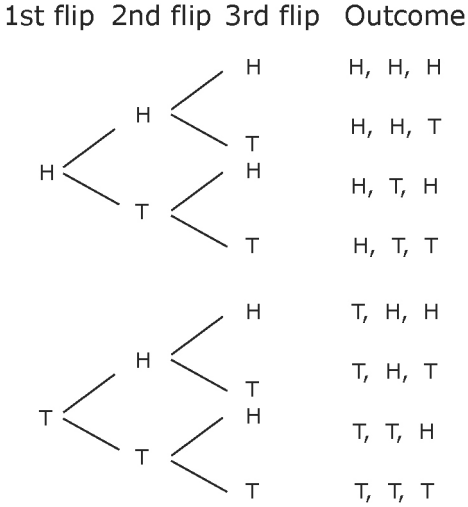
334, 338, 343, 344, 348, 383, 384,
433, 434, 438, 443, 448, 483, 484,
833, 834, 843, 844
There are 18 different 3-digit numbers possible.

b) Systematically list all the different possible outcomes.

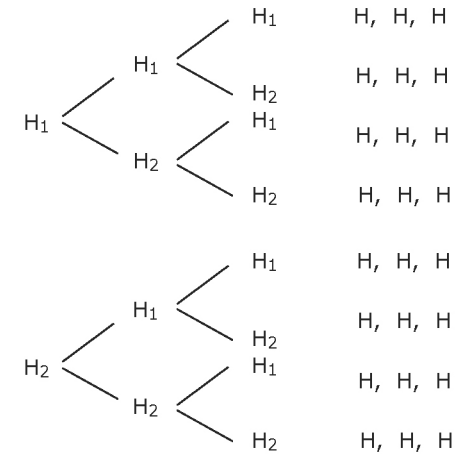
333, 334, 338, 343, 344, 348, 383, 384, 388,
433, 434, 438, 443, 444, 448, 483, 484, 488,
833, 834, 838, 843, 844, 848, 883, 884, 888
There are 27 different 3-digit numbers possible.

4. In Method A there are 49 possible numbers for each ball selected, or 49 × 49 × 49 × 49 × 49 × 49 possible combinations. In Method B, there are 49 possible numbers for the first ball, 48 for the second, 47 for the third, and so on, or 49 × 48 × 47 × 46 × 45 × 44 possible combinations. Method A had more combinations, so it would be more difficult.

5. Tree diagram for regular coin:



One of eight possible outcomes is H, H, H.
Tree diagram for special double-headed coin:



Eight of eight possible outcomes are H, H, H.
Eight of nine H, H, H outcomes are from the special coin. So, the probability that the special coin was pulled out is 8 out of 9.