1a. Consider two six sided dice. One die has 2 red, 2 green, and 2 blue sides. The other die has 3 red sides and 3 blue sides. One die is selected at random and rolled. The result is red. What is the conditional probability that the first die (i.e., the die with 3 colors) was chosen?

1b. Consider two cards. One is black on both sides. The other has one white side and one black side. If a card is chosen at random and the side facing up is black, what is the conditional probability that the other side is black too?

2. Consider a standard deck of 52 cards. Shuffle the cards, and then deal them onto the table, one at a time, without replacement.

2a. Find the probability that the first card dealt is a queen.
2b. Find the probability that the last card dealt is a queen.
2c. Find the probability that the third card dealt is a queen.
2d. Find the probability that the jth card dealt is a queen, for $1 \leq j \leq 52$.
2e. Find the conditional probability that the 19th card dealt is a queen, given that the first card dealt is a queen.
2f. Find the conditional probability that the 19th card dealt is a queen, given that the first and seventh cards dealt are queens.

3. Suppose two 6-sided dice are rolled, and the sum is 8 or larger. What is the conditional probability that at least one value of 4 appears on the dice?

4. Consider a red 4-sided die (numbered 1, 2, 3, 4), a green 4-sided die (also 1 to 4), and a blue 6-sided die (1 to 6). Roll the three dice (simultaneously).

Let B denote the event that the sum of the three dice is 5. Let A_j (for $j = 0, 1, 2$) denote the event that exactly j of the 4-sided dice have value 2.

Find the values of $P(A_j \mid B)$ for each j. Make sure that these three conditional probabilities sum to 1, i.e., that $P(A_0 \mid B) + P(A_1 \mid B) + P(A_2 \mid B) = 1$.