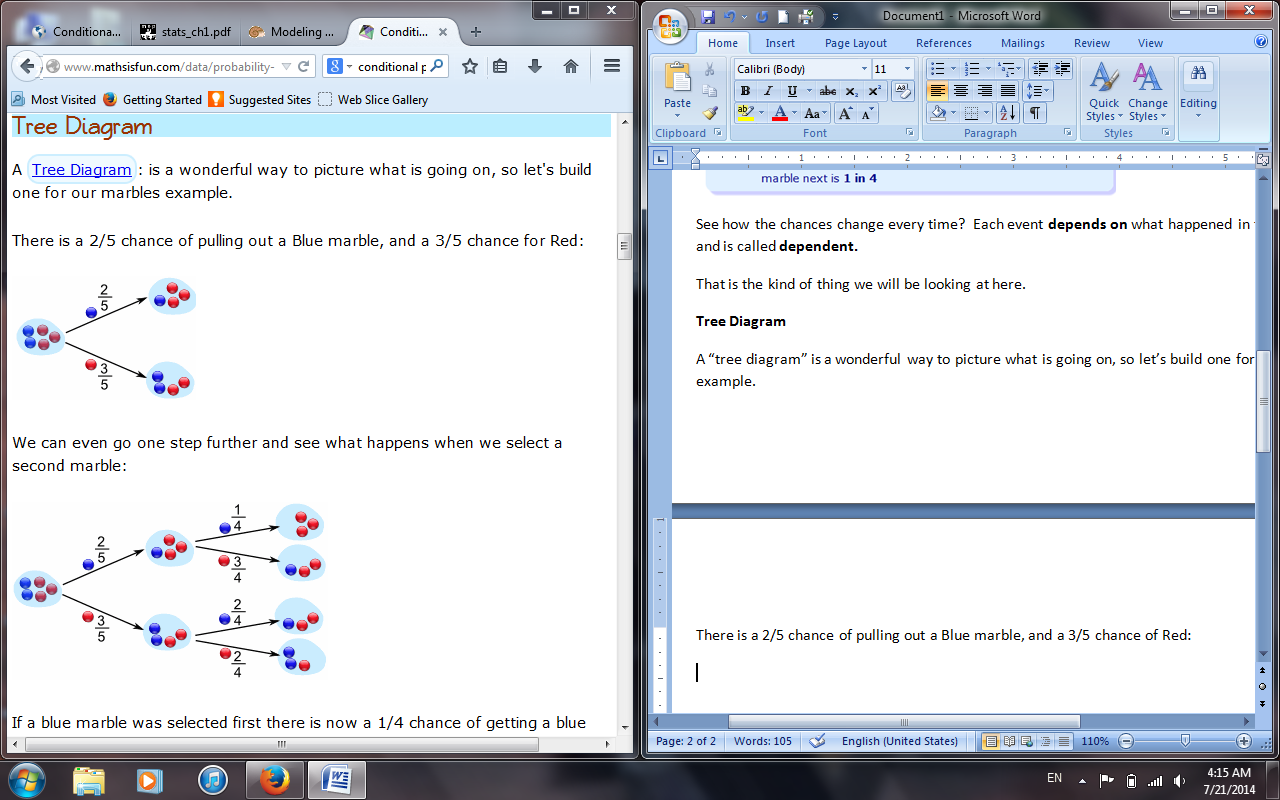
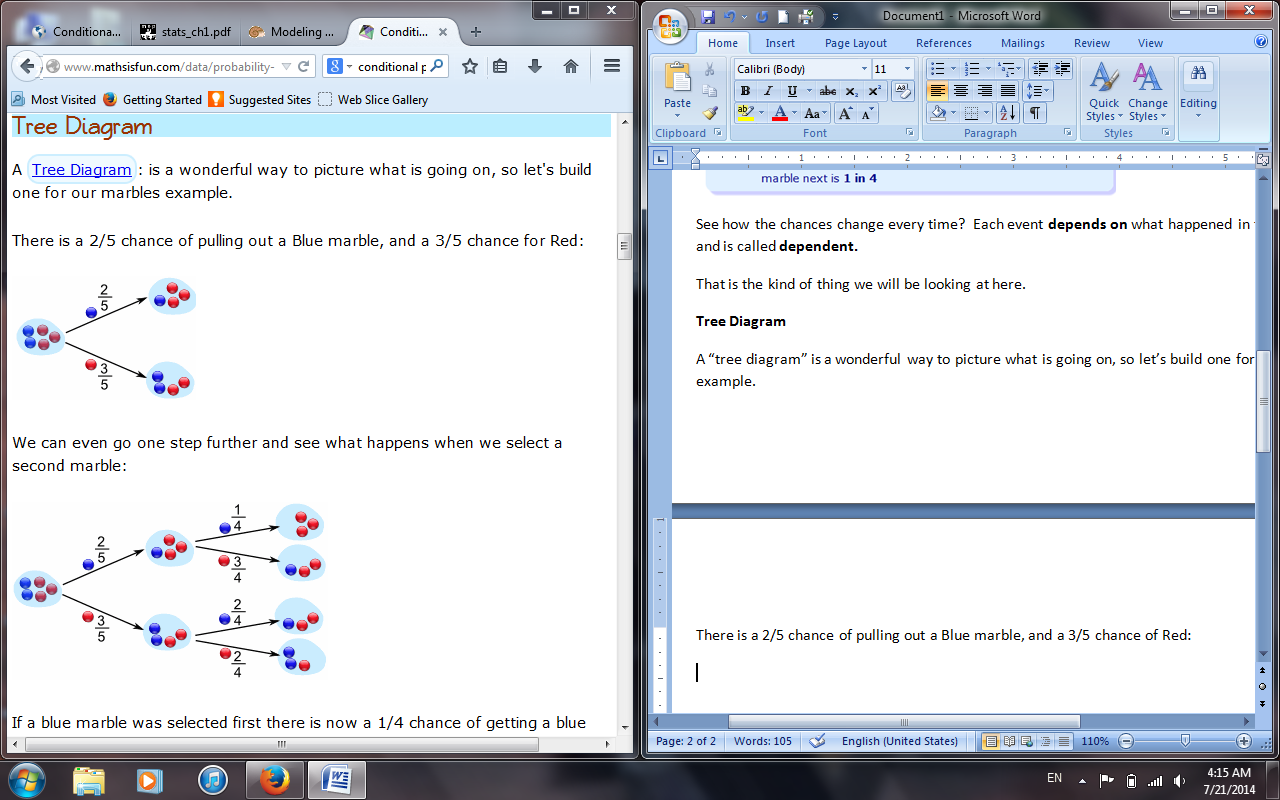
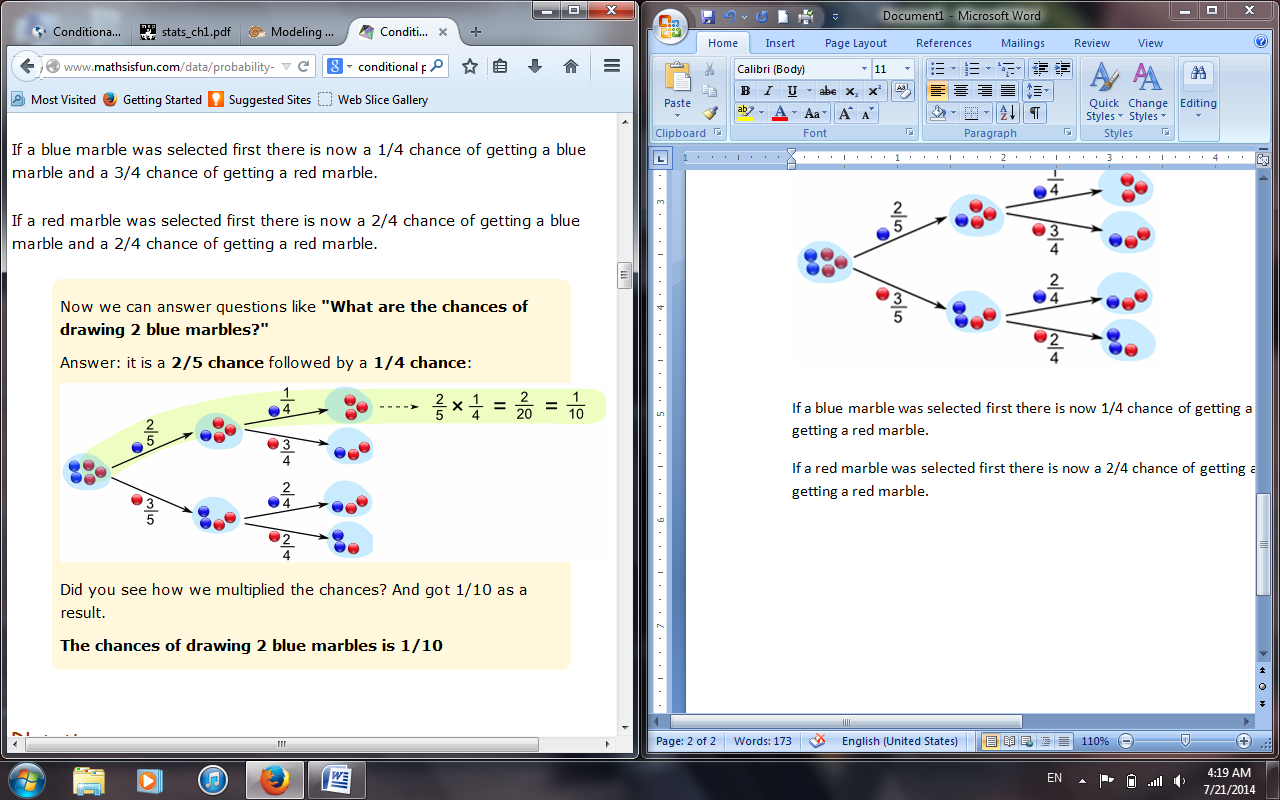
**Tree Diagram**

A “tree diagram” is a wonderful way to picture what is going on, so let’s build one for our marbles example.

There is a 2/5 chance of pulling out a Blue marble, and a 3/5 chance of Red:

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We can even go on step further and see what happens when we select a second marble:



If a blue marble was selected first there is now 1/4 chance of getting a blue marble and 3/4 chance of getting a red marble.

If a red marble was selected first there is now a 2/4 chance of getting a blue marble and 2/4 chance of getting a red marble.

|  |  |
| --- | --- |
| The LINK: Dave's Freight Company sends 35% of packages 'standard' and the rest by 'express.’ During shipping sometimes items get lost. 20% of 'standard' freight is lost while 45% of 'express' freight is lost. What is the probability a package is lost? | |
| Verbal | Diagram |
| When building a tree diagram for conditional probability follow the guidelines below:  **Step 1: Chronological Order**  Decide which event happened first. In this case, a package has to be shipped BEFORE it can get lost.    **Step 2: Number vs Probability**  Begin with a number of things rather than a probability. Lets start with an assumption that 1000 packages were shipped by Dave’s Freight Company.  **Step 3: Build your Tree Diagram in Chronological order.**  **Step 4: Insert Probabilities**  **Step 5: Evaluate the probabilities** | Notes:   * Probabilities or percents go on the branches. * Outcomes go with the boxes. |
| Calculations | Communication |
| 1. **Event 1: Shipping Method**   Start with the total number of items and calculate the first set of percentages by multiplying the percent by the total number.   1. **Event 2: Status**   Multiply the new percentages for getting lost or not lost by the new total number of packages in each category. | 1. When you add up all of the outcomes after Event 1 what do you get? Why?  2. When you add up all of the outcomes after Event 2 what do you get? Why?  3. How many packages are lost in shipping? Show or explain your answer.  4. Using your answer from number 3, and knowing there were 1000 packages total, what is the probability that a package is lost? Show or explain your answer. |