When teaching probability concepts to students, it is important to be able to simulate chance experiments. Such simulations serve to motivate student interest in the topic, demonstrate long-run behavior of phenomenon and illuminate chance situations that are difficult to resolve theoretically. This presentation will discuss how JavaScript was used for simulating probabilistic concepts in a course for in-service middle and high school teachers. Additionally, we want to present a 4-tiered structure which was used for the simulation assignments which allowed students with a wide range of computing abilities to use the JavaScript simulations for exploration. (Received September 10, 2007)