The comparative study of music and language has gained significant interest in cognitive neuroscience in recent years. Both music and language contain elements of rhythmic structure, the reproduction of which is mediated by working memory. Working memory is considered to be largely localized to the prefrontal cortex, with activation of the right hemisphere associated with processing complex or unfamiliar material. How rhythmic variations specifically influence working memory in musical and linguistic contexts is currently unknown. In order to assess this issue we administered novel working memory tasks, termed rhythmic motor, rhythmic speech, and stressed speech tasks, designed to isolate rhythmic variations in musical and linguistic contexts. Changes in the hemodynamic response in the prefrontal cortex during these tasks have been measured using functional near-infrared spectroscopy (fNIRS). Data from 10 participants will be considered in the results. In my results I expect to observe greater activation of the right prefrontal cortex for the musical rhythmic motor condition, and overall lower levels of activation for the two speech rhythm tasks.