Plastic scintillators are a common type of particle detector that is often used for their fast timing, robustness and cheap cost. Plastic scintillators are commonly used in veto systems since they can be made to large sizes needed for the experiment as well having a variety of dopants added to them to improve the detection of specific particles. As with any scintillator it is important to understand how the scintillator behaves in the environment that it will be in for the experiment. One consideration is the temperature that the scintillator will be operated at, specifically if the scintillator will be kept at cryogenic temperatures. Many inorganic scintillators have had their scintillation light yield determined at cryogenic temperatures, with many seeing an increase of up to 100% more (eg.http://link.aps.org/doi/10.1103/PhysRevB.84.214306). To generalize such tests to plastic scintillators, I present an experiment that analyzes the light yield of EJ-200, a commercial plastic scintillator from Eljen Technologies, between 300 K and 4 k using $\alpha$ excitation from an $^{241}$Am source, and $\gamma$ excitation from a $^{137}$Cs source.