This QuILT related to quantum key distribution can help students learn to apply simple quantum mechanical two state models to contemporary applications. The QuILT first helps students learn why some quantum key distribution protocols are not secure and then describes a protocol for secure quantum key distribution using two non-orthogonal polarization states of photons. The QuILT homework develops another secure protocol for quantum key distribution involving entanglement. There are warm-up exercises to review some basics before describing the quantum key distribution protocols. The simulation for the QuILT homework was developed by Antje Kohnle (<http://quantumphysics.iop.org>).