In this paper learning of decision makers that face many different games is studied. As learning separately for all games can be too costly (require too much reasoning resources) agents are assumed to partition the set of all games into analogy classes. Partitions of higher cardinality are more costly. A process of simultaneous learning of actions and partitions is presented and equilibrium partitions and action choices characterized. The model is able to explain deviations from subgame perfection that are sometimes observed in experiments even for vanishingly small reasoning costs. Furthermore it is shown that learning across games can stabilize mixed equilibria in 2×2 Coordination and Anti-Coordination games and destabilize strict Nash equilibria under certain conditions.