Our ability to synthesize novel functional materials at the nanoscale relies on the design and synthesis of versatile, tunable, atomically precise building blocks. Clusters of atoms typically exhibit physical properties beyond those of their constituent atoms, and new phenomena (e.g. electronic, magnetic) may emerge in such materials. In this talk, I describe a method to create site-differentiated clusters and present various synthetic approaches toward creating materials from these building blocks. The cobalt selenide clusters fundamental to this study are members of a larger class of clusters with the \([M_6E_8]\) stoichiometry (\(M = \text{metal}, E = \text{chalcogen}\)). There are two ways to prepare suitable, reactive \([M_6E_8]\) monomers for bonded assemblies: (a) incorporating a secondary functionality on the capping ligand, and (b) introducing removable, reactive ligands on the cluster surface. Rationally designed chemical transformations give us precise control over the extent and dimensionality of the resulting materials.