We consider tunneling transport through a Mn_{12} molecular magnet using spin density functional theory. A tractable methodology for constructing many-body wave functions from Kohn-Sham orbitals allows for the determination of spin-dependent matrix elements for use in transport calculations. The tunneling conductance at finite bias is characterized by peaks representing transitions between spin multiplets, separated by an energy on the order of the magnetic anisotropy. The energy splitting of the spin multiplets and the spatial part of their many-body wave functions, describing the orbital degrees of freedom of the excess charge, strongly affect the electronic transport, and can lead to negative differential conductance.