1052-20-110 **Thomas Tucker*** (ttucker@colgate.edu), Math Department, Colgate University, Hamilton, NY 13346. *Seeing symmetries of surfaces in 3-space.*

It is shown that a surface of genus $g > 1$ can be embedded in 3-space with rotational symmetry of order n if and only if $g = cn - r$ where $-1 \leq r < n$ and $c > r$; these are the cyclic group actions on surfaces that one can "see". Orientation-preserving actions by the other spherical groups A_4, S_4, A_5 are also considered. In general, given a group G, one can ask for the spectrum of all g such that G acts on the surface of genus g (not necessarily as isometries of 3-space). An interesting class of groups would be those whose genus spectrum includes all sufficiently large g. (Received August 23, 2009)