1014-U1-848 **Jacqueline Anderson Hall*** (`hallja@longwood.edu`), Dept of Math & CS, Longwood University, 201 High Street—Ruffner 334, Farmville, VA 23943. *Discovering the Euler Characteristic & Duality Through Platonic Solids: AKA "Exactly Five Platonic Solids—Part II".*

In this demo we will count characteristics of the platonic solids. For each solid we will count the number of faces (F), edges (E), vertices (V), sides per face (n), and faces meeting at a vertex (m) and record this on a table (along the way noticing a relationship between E,F, and n and between V, F, n, and m. After observing the dual relationships evident in the table we explore that duality using the classroom as a giant cube and yarn to produce the dual octahedron. Next we look for a relationship between F, V, and E which holds for all the solids and rather quickly discover the Euler characteristic V-E+F=2. We then use our observations and abstract a bit. Using the patterns we have observed and the subsequent equalities, we answer questions such as "If it were possible to have a platonic solid with 10 vertices and 3 faces meeting at each vertex, how many faces would its dual have? What would the faces be?" or "Why would it be impossible to have a platonic solid composed of 10 triangles?" (Received September 25, 2005)