Observations reveal concentrations of molecular line emission on the sky, called “clumps,” in dense, star-forming molecular clouds. These clumps are believed to be the eventual sites of star formation. We study the three-dimensional analogs of clumps using a set of self-consistent, time-dependent numerical models of molecular clouds. The models follow the decay of initially supersonic turbulence in an isothermal, self-gravitating, magnetized fluid. We find the following. (1) Clumps are intrinsically triaxial. This explains the observed deficit of clumps with a projected axis ratio near unity, and the apparent prolateness of clumps. (2) Simulated clump axes are not strongly aligned with the mean magnetic field within clumps, nor with the large-scale mean fields. This is in agreement with observations. (3) The clump mass spectrum has a high-mass slope that is consistent with the Salpeter value. There is a low-mass break in the slope at \( \sim 0.5 \), although this may depend on model parameters including numerical resolution. (4) The typical specific spin angular momentum of clumps is \( 4 \times 10^{22} \text{ cm}^2 \text{ s}^{-1} \). This is larger than the median specific angular momentum of binary stars. Scaling arguments suggest that higher resolution simulations may soon be able to resolve the scales at which the angular momentum of binary stars is determined.