A. Boyce, T. Maule and J. Gordon, Division of Science, Math and Computer Science, Central Methodist University. **The Microscale Determination of the Molar Mass of Metals Using a Gas Pressure Sensor.** Many metals react with mineral acids to produce hydrogen gas. In this work, small amounts, less than 0.100g, of manganese and zinc were individually reacted with hydrochloric acid to produce hydrogen gas in known stoichiometric ratios. The pressure of the hydrogen gas generated was measured using a gas pressure sensor. The gas pressure was used to determine the moles of hydrogen gas produced and, ultimately, the moles of metal reacted. Using the mass and moles of the metals, the average molar masses of manganese and zinc were determined to be 57 ± 3 g/mol and 65 ± 3 g/mol, respectively.