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Rolling Railgun: A Lab Activity for Introductory Electromagnetism TAYLOR PETTAWAY, HANNAH CLARK, MARK EDMONSTON, JAMES OVERDUIN, Department of Physics, Astronomy and Geosciences, Towson University — We describe a laboratory exercise for an introductory calculus-based electricity and magnetism course in which students construct and characterize the performance of a “rolling railgun” formed by one or more pairs of small neodymium coin magnets connected by a ferromagnetic axle which carries current between two rails connected to an ordinary 9V battery. The magnetic field of the wheels (the magnets) acts on the current in the axle to propel the whole apparatus along the rails. This exercise can be scaled up from a simple, mostly qualitative activity to a more comprehensive comparison between theory and experiment that will challenge students’ calculus skills. The required components are small and inexpensive enough to mail to students who are taking the course remotely. We report on our initial success in incorporating this lab into our curriculum at Towson University.

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