1086-H5-885   **Michael Olinick*** (`molinick@middlebury.edu`), Department of Mathematics, 314 Warner Hall, Middlebury, VT 05753. *Some Mathematics of Nonrenewable Resources: From Arithmetic to Optimal Control Theory.*

Our current civilization is heavily dependent on nonrenewable (exhaustible) resources. We use petroleum, coal, natural gas and uranium-dependent nuclear power to create electricity, heat and cool our homes, power our vehicles and manufacture our goods. Products we use every day require minerals such as copper, gold, silver, zinc and aluminum which we use up faster than the earth can replenish them. How long will such nonrenewable resources last? Are there optimal ways to manage a dwindling supply? We will illustrate how such questions can be approached using a variety of models that can be successfully integrated into a range of courses including college algebra, calculus of one and several variables, differential equations, discrete dynamical systems, computer simulation, and optimal control theory. (Received September 14, 2012)