1046-34-698   **Don Hinton** and **Maeve L McCarthy*** (`maeve.mccarthy@murraystate.edu`), Mathematics & Statistics, 6C Faculty Hall, Murray, KY 42071. *A Mass, a Spring, and a String.*

We consider the problem of the oscillation of a string fixed at one end with a mass connected to a spring at the other end. The problem is investigated of minimizing the first eigenvalue of the system when subjected to a fixed total mass constraint. For a small spring constant, the minimum eigenvalue is obtained by concentrating all the mass the the end with the spring. As the spring constant is increased, a critical value is reached so that beyond this point the minimum eigenvalue is obtained by concentrating all the mass at an interior point. (Received September 10, 2008)