

AD420 • ME444 • MKTG594 Motorola Project
Fall Semester, 2006**Stephen Melamed**, Industrial Design, College of Architecture & Arts
Michael J. Scott, Engineering, College of Engineering
Albert Page, Marketing, College of Business Administration**Assignment** **No. 2.b** Mechanical Engineering - Skills Assessment**Project Description**

Back-of-the-envelope estimation and material selection are crucial engineering skills. Provide estimated answers for the following four questions. Show your reasoning clearly, be clear about the information required, and acknowledge all your sources. If you make a sketch to solve the problem, please turn in all sketches as well.

1. Consider an electric generator that runs off compressed air, and imagine connecting it to a standard scuba tank in such a way that the diver would be able to breathe the air after it flows through the generator. How much useful electricity could such a device produce on the air used by a diver from one tank in a single dive?
2. Using two “D” cell batteries as the sole source of power, how much tea could you heat from room temperature to a desirable temperature for drinking?
3. Consider a bed of rollers that might be used as a gravity conveyor to move packages from a truck bed to the ground. Making whatever assumptions you want about dimensions and other parameters, how long will it take a package released from the top of the conveyor to reach the bottom?
4. What material and manufacturing process would you choose for the housing of a new external computer component such as a DVD-writer? You may make any special assumptions you want (e.g., specially designed for damp conditions). Explain your reasons, and please list the other materials you considered and your reasons for rejecting them.

Project Requirements

All responses are to be presented in the form of a memo or e-mail to your boss, who can be assumed to have some technical background, but not as much expertise as you have. In other words, for each problem tell a story that can be read straight through from beginning to end. Complete sentences are encouraged.

Submission

The back-of-the-envelope calculations must be submitted in hard copy, and indeed it is preferable that you turn it in exactly as you solved it. Additional electronic copy is also required.

Due Date

Tuesday, September 5, 2006