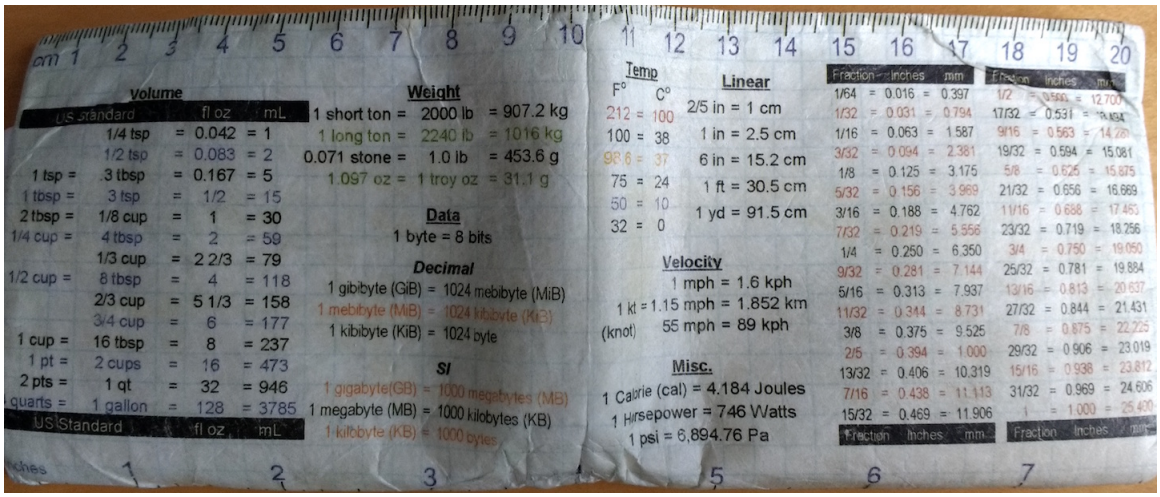
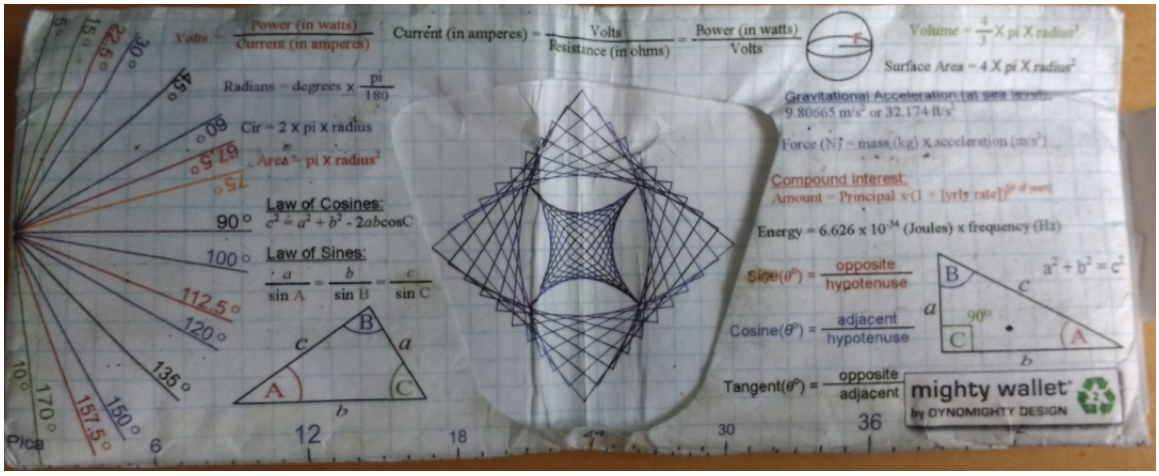
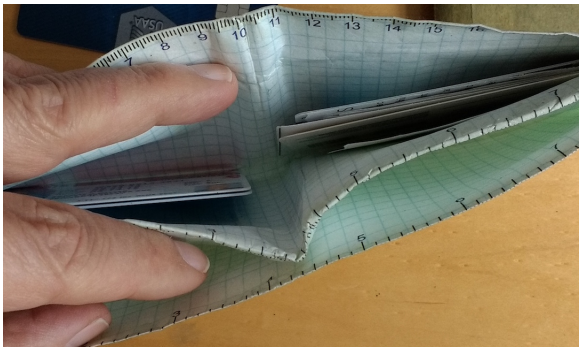
science wallet for MRSEC outreach: a proposal

Tom Witten December 21, 2016

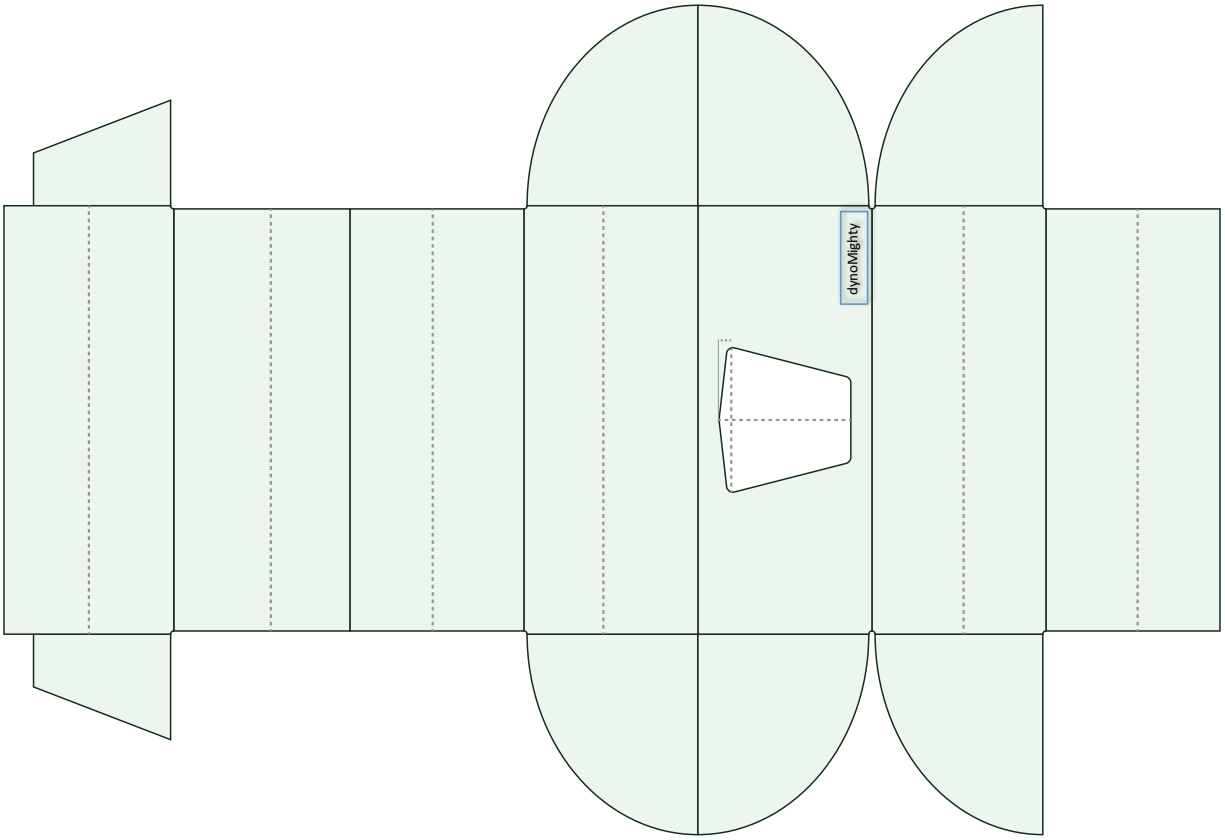
There is a wallet you can buy for about $12. It is just a sheet of Tyvek, the material of Fedex soft envelopes. Tyvek can be printed and can be laser cut. The makers, notably the Dyn-o-Mighty Corporation, offer many designs including the geek design shown below.







Here is the template showing the fold lines. The short dimension is about 22 inches.



I propose that we design the printing for our own Tyvek wallet showing our own science and our own reference material. I believe we could get this produced on the scale of hundreds at a unit cost in the 1–2 dollar range. At this cost, the user would have to fold it herself. I think we could make a design that was attractive, appealing, informative and a credit to our science without being self-promoting.

Content might include

- iconic images from our walls and web site. eg. quasi-crystal lattices, Wendy's collapse modes, Aaron/Suri's driven Ising lattices.
- List of many condensed-matter quantities in kT/nanometer/microsec units. Quantities could include viscosities, interfacial tensions, dielectric constants, stress-strain moduli
- Listing of critical exponents eg Feigenbaum exponent, KAM exponents.
- rulers, unit conversions and geometric data as in the wallet shown
- temperature nomograph
- websites for time standards, materials genome, APS, ACS, ...
- The inside where the bills are put can be decorated by eg. Feigenbaum diagram or long droplet breaking. There are four such surfaces, undecorated in the geek wallet shown above.
- Pictures of heros: G. I. Taylor, Alan Turing, Ken Wilson, Leo Kadanoff, Howard Berg, Ed. Purcell, etc

- hydrocarbon bond angles, DNA dimensions, Lipid bilayers
- Moire pattern where significant size ratios appear at calibrated scales. eg 1 cm, 2 cm, 4 cm, 1/2 cm, 1/4 cm,... in one direction and 1, 2, 1/2, 1/4 inch in another direction.
- many more things that we can collectively think of.
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Implementation

Clearly a design like this needs widespread input from our MRSEC members and many trial versions. If this idea wins support, we would start a process to gather ideas, assemble images, arrange these on the template and then evaluate these proposed designs and choose a winner. Widespread involvement of MRSEC people at all levels would be an additional advantage.

There should be a wiki-like web site where MRSEC members can

- suggest ideas, vote and comment
- submit graphic content in eg .pdf or .pptx format
- indicate which features of the geek wallet above should be kept, modified, re-arranged, expanded, or dropped.

This site should be set up at an early stage to enable wide participation from the start.

We'd aim to have the finished wallets ready by next December's MRSEC open house.

We would copyright the design, then offer it to the company that sells these wallets to reproduce at will. We would make a deal with them so that we end up with $\sim$1000 unfolded copies and the right to distribute these.