learning is not compulsory... neither is survival
2.009 Product engineering processes today

Product teardowns learn from the work of others
2.009 store
supplies for quick turnaround tests (buy/borrow)
# 2.009 store

## supplies for quick turnaround tests (buy/borrow)

### 2.009 Store

Welcome, David Wallace!

You are making purchases/borrowing on behalf of Staff Team.

Enter the quantity for items you are purchasing or borrowing.

<table>
<thead>
<tr>
<th>Description</th>
<th>$/Unit</th>
<th>Unit</th>
<th>Qty of Units</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayonet Mixer Nozzle for Epoxy Gun</td>
<td>$0.06</td>
<td>each</td>
<td>3</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4168</td>
</tr>
<tr>
<td>Epoxy Dispensing Gun</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McMaster Part No. 74695A12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy Packet, General Purpose</td>
<td>$1.41</td>
<td>packet</td>
<td>30</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4172</td>
</tr>
<tr>
<td>McMaster Part No. 7538A12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy Packet, Quick Setting</td>
<td>$1.35</td>
<td>packet</td>
<td>30</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4171</td>
</tr>
<tr>
<td>McMaster Part No. 7538A11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy, Loctite Hysol E-OS</td>
<td></td>
<td>tube</td>
<td>1</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4170</td>
</tr>
<tr>
<td>McMaster Part No. 6430A25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy, Loctite Hysol E-20HP</td>
<td></td>
<td>tube</td>
<td>all 1 on loan to</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4170</td>
</tr>
<tr>
<td>McMaster Part No. 6430A19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy, Loctite Hysol E120HP</td>
<td></td>
<td>tube</td>
<td>all 1 on loan to</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4170</td>
</tr>
<tr>
<td>McMaster Part No. 6430A24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy, Loctite Hysol E40FL</td>
<td></td>
<td>tube</td>
<td>1</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4170</td>
</tr>
<tr>
<td>McMaster Part No. 6430A26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Popsicle Sticks</td>
<td>$0.05</td>
<td>each</td>
<td>40</td>
<td>Rack R3, Shelf S3, Tray Unit 4000, Tray 9, Compartment 4173</td>
</tr>
</tbody>
</table>
2.009 store
supplies for quick turnaround tests

cardboard, foam core and foam

shop hours: Tuesday 6-9, Wednesday 6-9
pdl: off hours work, register to use starting on Monday
Product teardown
part of a benchmarking process

teardown exercise

practice the process: relevant to sketch models
learn about what’s in a product
observe design details
practice secondary research
organize information so others can understand it
practice organizing team to work quickly
get happy working in your team space
Product teardown
deliverable from each team at end of class

a pegboard display that allows one to...

easily understand the product (if unassembled need pictures of it assembled)
easily see what parts are in the product
obtain specified information about the parts/product
Product teardown
example: scanner
Product teardown

remember!

if the product comes disassembled:
   it needs to be assembled first!
   take a picture of it assembled

please do not disassemble batteries
Product teardown
resources for each team

resources

a product to teardown (on team table)
safety glasses (on window ledge, personalized and yours forever)
peg board mounted to team table
zip ties
baggies for small parts
guidelines for identifying plastics (also on website, burn tests!)
magnets and lighters for materials identification
scales for weighing parts
guidelines for estimating costs (also on website)
your phone cameras (dropbox link on website, emailed, pickup 4”x6” photo in 2009 computer area)
product and part information stickers
a consultant! (materials and costing)
a go pro!
Product teardown

product information sticker (2, one needed)

product name:

target customer:

retail cost:

estimated production volume:

location of manufacture:

estimated labor cost:

cost of the most expensive part:

you will want pictures of the assembled product (and in use as appropriate)

images at key disassembly states

packaging and the unpacking experience are part of the product
# Product teardown

**part information sticker (100, as needed)**

<table>
<thead>
<tr>
<th>part material:</th>
</tr>
</thead>
<tbody>
<tr>
<td>method of manufacture:</td>
</tr>
<tr>
<td>estimated manufacture cost:</td>
</tr>
<tr>
<td>number of times used in product:</td>
</tr>
</tbody>
</table>

For every answer, indicate your confidence:

- **guess**
- **hunch**
- **educated estimate**
- **know/verified**
Teardown exercise

getting started

i) go to your team area in the lab
your product and materials are on team table

ii) put on your safety glasses

iii) develop a work strategy to utilize the team

iv) organize thoughtfully, a timed deliverable

v) tool officers have your tool kit combination

vi) complete the deliverable

vii) team picture at the end
Teardown exercise
and remember

these products are giving their lives for education…
so enjoy and learn from the displays!