ideas must be put to the test.
that's why we make things,
otherwise they would be no more than ideas.

Andy Goldsworthy, 1956-
English sculptor and photographer
2.009 Product engineering processes today

Sketch model review broaden and deepen sketch models test ideas
Sketch model review
10 days after ideas presentation!

Monday

Three ideas presentation
September 25, during class
3 ideas per section

Mockup review
October 19
2 mockups per section

Assembly review
November 1 & 3
1 assembly

Final selection
October 23-26
1 concept per team

Technical review
November 16
1 (almost) prototype

Final presentation
December 11
1 alpha prototype

Sketch model review
October 5
3 models per section
2.009! product engineering processes

Schedule keeping track of it!

**Coming up! Ideas Presentation (Sept 25)**

What's up? This week in 2.009

**Class Wednesday:** sketch models!

Schedule a time for help plotting and mounting your idea's presentation posters

Schedule a time for practicing your ideas presentations with communication instructors

[2.009 project timesheets](#) are now online (also under the schedule menu).

**Of interest:** (archive)

Yoda 101 for team yodas. Thursday, 7:00 PM in Pappalardo

**This week in lab**

Exploring ideas and preparing for the 3 ideas presentation

- please read the [lab 2 outline](#)

[Credit card training](#) for financial officers. Thursday noon-1 PM in 3-434.

**Observation exercise** section signup form. Please review the submission instructions (it's for your lab). There is a list of who-is-going-where if you would like to team up with classmates who are going to the same location.
idea/opportunity selection
last week (categories)

lab this week

<table>
<thead>
<tr>
<th></th>
<th>Nail</th>
<th>Ring Shank</th>
<th>Staple</th>
<th>Screw</th>
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ideas must be put to the test.  
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Andy Goldsworthy, 1956-  
English sculptor and photographer  

2.009 Product Engineering Processes
Sketch model review means... development of opportunities into product ideas

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<td>Sketch model review</td>
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<td>To meet weight constraint of less than 30 lbs</td>
<td>To meet cost constraint</td>
<td>4 Hawker 6V batteries</td>
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<td>battery weight must be less than 13 lbs</td>
<td>batteries must be lead-acid</td>
<td>Best known solution</td>
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<td>4</td>
<td>150 W-hr at 1 hour rate</td>
<td>12.3 lbs total weight</td>
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<td>Assumptions:</td>
<td>2.5 mph</td>
<td>165 lbs</td>
<td>0.80 hour</td>
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<td>29 lbs</td>
<td>187.5 W available</td>
<td>with energy</td>
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<td>Minimum drive efficiency allowable</td>
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more idea generation
more research
(customer needs/benchmarking)
sketch models/testing
more feasibility estimates
And what is a sketch model?

**definition**

Simple *physical* models made of soft, low cost, easy-to-work materials

3D analog to sketching

**Made to learn and test**

articulate an idea
understand product scale
explore user interaction issues
assess operational issues
establish common shared view
What is *NOT* a sketch model?

**anti-definition**

Simple *physical* models that have *no purpose* and are made of soft, low cost, easy-to-work materials.
Sketch modeling techniques

Cardboard
Cardboard
bending sharp corners
Cardboard
fastening (when you cannot bend)
Cardboard
bending allowance
Cardboard
making large radii
Cardboard holes
Sketch modeling techniques

foam core
Foam core
Sharp radii
Sketch modeling techniques

blue foam
Blue foam

cutting straights, circles and other shapes
Blue Foam

joining

water-based contact cement
Blue foam

shaping
Blue foam

painting

water-based is good

organic solvent-based is bad
Wrap up

miscellaneous items

sketch modeling tutorials on website (of interest)
credit card training Thursday noon PM in 3-434
yoda 101: Thursday 7:00 PM in Pappa
illustrator tutorial 5 PM Friday in Pappa

no open toe shoes for class on Friday!

plotting and poster mounting schedule online
presentation practice schedule online