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
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
3-ideas presentation

we picked a more focused direction for you

why?
More idea exploration?
Why waste time?

“just tell us what the design problem is and we will do the detailed engineering.”

the mere formulation of a problem is far more often essential than its solution

Albert Einstein
1879-1955, Nobel prize in physics
a relatively smart person

there are many smart, well educated people in the world
3-ideas presentation

Tips

went well? Yes!

could every one of the presentations be improved? Yes!

how to improve?

“practice is the best of all instructors”
Publilius Syrus, Author, 1 B.C.
3-ideas presentation

Tips

how to improve?

practice is the best of all instructors
Publilius Syrus, Author, 1 B.C.

stand with poster
avoid rocking
energetic
not forced
avoid memorizing
avoid filler words
um, uh, basically, like…
interact with poster
but look at audience
have a clear ending
3-ideas presentation
Presentation revisit

what worked well?
3-ideas presentation
Presentation revisit

what worked well?
responding to instructor feedback

the least useful comment is “good job”

we received comments that were unfair

we received conflicting advice
and now

a mini quiz! More estimation

name on index card, 4 minutes

i) what is energy and what are its units?
ii) what power is needed for a small bird to fly?
iii) define mechanical horsepower.
iv) how much power can you output continuously for 30 minutes?
2.009 Product engineering processes

And finally

**sketch model review** broaden and deepen

**sketch models** test ideas
Effort

Modeling at different levels of ambiguity/certainty
Sketch model review
Next Thursday!

three ideas presentation

one team
1 lab instructor
8-9 students
1 lab instructor
8-9 students
1-2 mentors

Section A
3 ideas
1 idea
Section B
3 ideas

Section A
sketch models
concept mockup

Section B
sketch models
concept mockup

Team

sketch model review
(evening, October 6)

mockup review
final selection
assembly drawing
technical review
Sketch Model Review
Means... development of ideas into concepts

- more idea generation
- more research: customer needs/benchmarking
  (information officer session Thursday)
- sketch models/testing
- feasibility estimates

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- To meet weight constraint of less than 30 lbs
- To meet cost constraint, batteries must be lead-acid
- Assume 2.5 mpg with user weight of 165 lbs and scooter weight of 29 lbs
- Total mechanical power 139 W required
- Minimum drivetrain efficiency allowable 74%
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
Cutting and bending sharp corners
Cardboard
Making large radii
Cardboard

Holes
Cardboard

Fastening (when you cannot bend)
Sketch modeling techniques

Foam core
Foam core

Cutting
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 (/resources)

notebooks in lab this week
notebook images and timesheets 10 PM Thursday

team activity Wednesday
don’t wear open toe shoes
iPhone and android users: install HP ePrint Home & Biz
tool officers: know combination

sourced parts workshop: build! 7 PM tonight