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!
Schedule
keeping track of it!

2.009 Product Engineering Processes

Information    Schedule    Teams    Team Manual    Project Info    Resources    Gallery

THREE

Ideas presentation: September 23
What’s happening this week?

Class Wednesday
- sketch models!

Timesheets are linked under the schedule menu

Of interest: (archive)

Tutorial: Credit card training for financial officers. Thursday at noon in 3-434

Tutorial: Posters in illustrator. Friday 4-5 PM on illustrator, 5-6 PM consultation on posters. In Pappalardo.

- the elevator pitch
- crafting an elevator pitch

- on design sketching and ideas
- the basics of design sketching

Lab information
Observation exercise sign-up. If you would like to buddy up, see who is going where.

Lab 2: Exploring opportunities and preparing for the ideas presentation
- please read the lab 2 outline
- please be ready to quickly pin-up your top idea from the observation exercise

Schedule a time for your section to have help plotting and mounting your idea posters

Schedule a time for your section to practice idea pitches with the communication Instructors
idea/opportunity selection
last week (categories)

lab this week

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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
Sketch model review means... development of opportunities into product ideas

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 models: what should we do?

I need to make something? OK, I’ll make something!
Sketch models: what should we do?
step 1: what is the question?

articulate: what are we uncertain about?

definition: what is the idea?
feasibility: does core technology exist and do we understand it?
user need: do we understand the user and our value proposition?
market: who is our customer and how interested are they?
scope: do we have the needed resources and skills?
Sketch models: what should we do?
step 1: what is the question?

prioritize: which questions do we answer first?

Pugh chart
level of uncertainty
Sketch models: what should we do?
step 1: what is the question?

prioritize: which questions do we answer first?

Pugh chart
level of uncertainty
criticality to viability
learning outcomes
Sketch models: what should we do? step 2: what type of model?

explore: what model foci relate to the question?

form: focus on shape embodiment
scale: focus on properties such as size or mass
visualization: focus on communication
operational principles: focus on tech and physical behavior
system configuration: focus on “what are the bits?”
integration: focus on “do these bits play well together?”
interaction: a focus on the use model
usability: a focus on user understanding
experience: a focus on the user’s feeling
Sketch models

step 2: what type of model?

select: what type of model?
     based on question and focus
     looks-like: fidelity in appearance
     works-like: fidelity in behavior

may be physical or digital!

lowest fidelity possible to resolve the question!
Sketch models: what should we do?

**example**

**electric scooter**

- **concern:** product definition
- **model focus:** scale, usability
- **type:** works-like (kinematics)

**helicopter lift**

- **concern:** product definition
- **model focus:** visualization, operation
- **type:** works-like (operating principle)
Sketch models: what should we do?

- Articulate uncertainties as questions
- Prioritize questions
- Explore relevant model focus categories
- Select model type
Low fidelity vs BAD
what’s the difference?

just enough fidelity, well executed
Low fidelity vs BAD
what’s the difference?
insufficient fidelity, not looks-like, not works-like—it’s nothing like!
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
illustrator tutorial 4-5, 5-6 PM Friday in Pappa

plotting and poster mounting schedule online
presentation practice schedule online
Happy career fair
no class on Friday