Are you creative? (check as appropriate)

Yes ✔️ No 🟢

People who believe they are creative, are; people who don’t, aren't.
“if you think you can do a thing or think you can't do a thing, either way you're right.”

Henry Ford
founder of Ford Motor Company, father of modern mass production
1863-1947
2.009 product engineering processes
last week

motivation
+ creativity
+ informed craft
+ process

project theme and context
idea generation strategies
typical PD milestones/structure
2.009 product engineering processes today

brainstorming milestone
project idea fair (tonight)
meetings
teams
teamwork challenge

informed craft process
mini quiz!
One minute

write your name on the top of your index card

list 4 individual creativity strategies
strategy #1
look for the next right answer

deadline #2
look from multiple viewpoints

strategy #3
defer all judgments
tell the left side of your brain to be quiet

strategy #4
challenge assumptions
question assumed boundaries or norms
number of ideas in 5 minutes
improvement after instruction (Lincoln lab)
a quick question

I have been asked to plant 4 trees equidistant from each other

what about a hill?
Ways to mitigate fire

number of ideas per student

entire class: 1113 ideas
278 ideas/minute

average ~1.9 ideas/minute/person

target ~ 4 ideas/minute

water _____ over fire, not safe!

was anwar
Brainstorming deliverable for lab this week

at least 20 project ideas in notebook, based on observation you might be pleasantly surprised if you have many more

top 5 sketched on separate sheets

everything that follows depends on this!

opportunity/need inspiration, feasible, preliminary market research
Effort and results
Total hours spent by team vs. final outcome
Effort and results

Hours spent on ideation vs. final outcome

importance of rigor in breadth
Workflow

each stage builds on prior effort

100%

Homework

For real
Project timesheets
why in 2.009?

representative of real practice

reflection on where/how you are spending your time

no course staff will see your data!

data for your business model

improve the 2.009 product development process
**Project timesheets**

**how they work**

<table>
<thead>
<tr>
<th>Activities</th>
<th>time alone hr</th>
<th>time alone min</th>
<th>time w/others hr</th>
<th>time w/others min</th>
<th>short description of details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designing</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td>secondary research on web</td>
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<tr>
<td>generating design concepts</td>
<td>0</td>
<td>30</td>
<td></td>
<td></td>
<td>listing ideas in notebook</td>
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<tr>
<td>selecting design concepts or details</td>
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<td>0</td>
<td>1</td>
<td>30</td>
<td>pinup and organizations of ideas with team</td>
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<tr>
<td>sketching ideas</td>
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<td>0</td>
<td></td>
<td></td>
<td>preparing annotated sketches</td>
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<tr>
<td>CAD modeling</td>
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<td></td>
<td></td>
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<tr>
<td>writing about your project</td>
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<td>0</td>
<td></td>
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<td></td>
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<tr>
<td>analyzing or calculating</td>
<td></td>
<td>0</td>
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</table>

log in and start using the form

(MIT username. notebooks, scheduler, store, timesheets are all same password)

spreadsheet for offline note keeping

separate entry for each day
Project timesheets guidelines

do not over-bill or under-bill

be accurate and complete

fastest to make entries every day that you work on the class

your lab instructors and course instructors will not see your data. Scripts are used by a 3rd party to process the data (in bulk) after the term
Project idea fair
7 PM (sharp) to 8 PM tonight

See *ideas fair session* link on homepage
Project idea fair
7 PM (sharp) to 8 PM tonight

Pizza at 6:30 PM in Pappalardo
Project idea fair

7 PM (sharp) to 8 PM tonight

conference with parallel sessions

use team mailing list to coordinate
use slack site/dropbox: Tutorial 4:00 today

be asking about opportunities
if you cannot attend, please make sure your session is covered

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Team Members</th>
<th>Room</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:05-7:30 PM</td>
<td>Challenges of circus arts Performance</td>
<td>David Olaleye, Elaine Phillips, Sara Wilson, Thad Daguth</td>
<td>1-134</td>
<td>Les 7doigts</td>
</tr>
<tr>
<td>7:35-8:00 PM</td>
<td>Snow removal in city</td>
<td>Gina Han, Gwen Edgar, Steven Okada, Tony Stuart</td>
<td>1-132</td>
<td>Cambridge Snow Center</td>
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<td></td>
<td>Safety and hazards of stonework</td>
<td>Jami Rose, Kelly Chen, Travis Leathrum, Upa Adhikari</td>
<td>5-233</td>
<td>Bricklayers and Allied Craftsmen Union</td>
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<tr>
<td></td>
<td>Rainwater harvesting in Thar desert</td>
<td>Joseph Alvarez, Mario Contreras, Veronica LaBelle</td>
<td>1-135</td>
<td>OneProsper International</td>
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<tr>
<td></td>
<td>Redesign police transportation vehicle</td>
<td></td>
<td>1-246</td>
<td>MIT police</td>
</tr>
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<td></td>
<td>Safety and hazard at maker space</td>
<td></td>
<td>1-242</td>
<td>Artisan's Asylum</td>
</tr>
<tr>
<td></td>
<td>Food safety and handling</td>
<td></td>
<td>1-371</td>
<td>Clover</td>
</tr>
</tbody>
</table>
Running meetings
the big picture

meeting ≠ chillaxin in a room around a big table

home page: of interest
a team is...?
more than a group

a group that is interdependent for overall performance

team!
why?

the need for teamwork grows with the challenge

none of us is as good as all of us

a good team!
well-defined work approach

meaningful purpose

clear performance goals

complementary skills

mutual accountability

communication

dream team
dream team

shared values

well-defined work approach

meaningful purpose

clear performance goals

complementary skills

communication

mutual accountability
most important team success factor

- Shared values
- Mutual trust (mutual accountability)
- Inspiring vision (meaningful purpose)
- Complementary skills
- Rewards

percent of respondents

Ten3 global internet polls
Teamwork characteristics correlated with effectiveness

Positive:
- taking the initiative
- results orientation
- attention to detail
- clear guiding philosophy
  (e.g., meeting rules, team code of conduct)

Negative:
- informality
- high level of praise for performance

Teamwork
design success factors

Positive:
effective communication
management support (system integrators, yoda, lab instructors)
involvement of all relevant parties (e.g., user feedback throughout)

Negative:
team members unable to see different viewpoints (strong mental set)
organizational politics

Hitt et. al. The birth, life, and death of a cross functional new product design team,
HF5415.2.M37 no. 96-111
Teamwork challenge

**team role-playing and problem solving**

task

build the tallest free standing balloon structure

materials

144 balloons (in team color), 3 rolls packing tape,
3 tape dispensers, 3 pair scissors, pens and paper

where

outside, Killian court

deadline

1:50 PM during today’s class
Teamwork challenge
roles and rules

assemble your 2.009 team around the materials box
make sure you are with the right team
select a team manager
one team member wears the go pro (it’s on)
pick roles from envelope—keep confidential
all but team manager play assigned roles
do not tie balloons together
only use the materials provided
do not use chairs, ladders or climb objects to assemble structure
Teamwork challenge reflection

at 1:50 PM
judging
awards ceremony
pop your balloons
discuss your roles and how they impacted team performance
discuss ways that the team manager was effective
cleanup

start now!