Innovation & Ideation

"The best way to have a good idea is to have lots of ideas." - Linus Pauling
Team communication
Team communication

team email list format:
200b-animal@mit.edu

200b-tiger@mit.edu
I don’t get it.

What exactly don’t you get?

It turns from a building into a robot, right?

Precisely.

Well, what’s fun about that?

Well, if you had read your industry breakdown, you would see that our success in the action figure area has climbed from 27% to 45% in the last two years.

I still don’t get it.

What don’t you get?

There’s a million robots that turn into something. This is a building that turns into something. What’s fun about playing with a building? That’s not any fun.

This is a skyscraper.
Who is our Customer?

Our customers are the parents of children and other agencies who purchase products on behalf of kids

- Zion M. Hadley
Who is our Customer?

Product Use

user

purchaser

producer

retailer

Influence on Product Selection
What is play?

Play is the act of using items with a touch of imagination for enjoyment.

- Aliza Akhtar

Play is a state of mind
What is the opposite of play?

chore  work =  IIII  IIII  IIII  IIII  IIII  IIII  IIII  IIII  IIII  IIII

boredom =  IIII  IIII  IIII  IIII  IIII  IIII  IIII  IIII  II
What is the opposite of play?

“doleful work (chores) you don't enjoy but have to do” - Mojo Oke

“YALP” - Josiah Washington

“MIT GIRs” - Anna Weinstein
What is the opposite of play?

Quizzes!
- Jasmin Bouzarouata
Quiz!

1. What is your name?
2. What is play value?
3. What's the difference between innovation and invention?
4. What is creativity?
5. Write a caption for:
Play Value

Potential for Play
Developmental Benefits,
Variety, Motivation

Play value is what makes a toy fun!

As a designer, you want to create Play Affordances
Invention and Innovation

"Necessity may be the mother of invention, but **play** is certainly the father."
-Roger von Oech

**Invention** is making something that has never existed before.

Not a product, but a new technology.

PTFE
polytetrafluoroethylene
Invention and Innovation

**Innovation** is the application of new ideas/technologies or the combination of existing items in a novel way.

This is product design!

PTFE
polytetrafluoroethylene
Product design

Why not invention?
Creativity

The use of imagination to create original ideas.
Creativity in Design

novel and useful!
Neurological Analysis
Neurological Analysis
Right hemisphere and creativity

Music, visual art, language, perception
Neurological Analysis
Right hemisphere and creativity

Right, Posterior Superior Temporal Sulcus (PSTS)
- Processing novel metaphors in poetry (Gorana et al 2008)
- Novel connections between unrelated words (Mashal et al 2007)
- Linguistic creativity (Flaherty, 2005)

Right, Anterior Superior Temporal Sulcus (ASTS)
- "Aha!" Experience (Jung-Beeman 2004)
Ideation techniques

Free Form
or Intuitive Methods

GROUP WRITING:
- Brain Writing
- Brain Sketching
- Collective Notebook
- Pin Cards
- KJ Method
- Trigger Sessions

Free Writing
Brainstorming

New Perspectives
Techniques

- Lateral Thinking
- Challenging Assumptions
- Boundary Relax
- Negative Brainstorm
- Reversal
- Exaggeration

- Rolestorming
- 6 Thinking Hats
- Super Heros
- Disney Method

- Progressive Revelation
- Crossing Products

Structured
or Logical Methods

Morphological Analysis
- Attribute Listing
- Potential Problem Analysis
- FRDPARRC

TRIZ
ARIZ
ASIT
SCAMMPER

Associations
Techniques

- Provocation
- Bunches of Bananas
- Excursions
- Mind Mapping
- Free Association
- Association Mapping

- BruteThink
- Analogies
- Force Fit
- Focal Objects

Associations can be used to generate concepts based on linking ideas and finding new relations between connections.
Associations and Humor

Non-obvious connections

Making the incongruity congruent

Why was 6 afraid of 7?

...because 7 8 9
Cartoon Caption Test

New Yorker, caption contest 2008

"can you please pass the cow"
-bennett ellenbogen

things in the image

things related to coffee

things related to milk

relate back to boardroom meeting
Cartoon Caption Test

“let me start by welcoming you all to narcoleptics anonymous”
-mike worth
Association Mapping

“breaks will no longer be dictated by time to finish your coffee”

**names of coffee**
- joe, java

“who ordered from Java the Hutt?”

**products related to coffee**
- coffee maker, mug, coffee machine, grinder, tea

“the sink’s full again”

**places related to coffee**
- dunkin donuts, starbucks, kitchen, south america

“coffee sales have been soaring”

**types of coffee**
- black, decaffeinated, espresso, latte

“who ordered from Java the Hutt?”

“the sink’s full again”

**actions related to coffee**
- sipping, spilling, staining, drinking, burning, break

“is this the decaf?”

**served with coffee**
- donuts, breakfast, newspaper

“the crullers will be here shortly, as soon as they take the door off the hinge”

**things that go in coffee**
- milk, cream, dairy, sugar, stirrer, coffee beans, water

“where’s the bathroom?!”

“coffee sales have been soaring”
Association Mapping

Form
Round
Flat
1-3 cm dia
Association Mapping
Association Mapping

Column $\rightarrow$ 
*Functional requirement:* 
Structural support $\rightarrow$ Bone

\[ \text{Column} \rightarrow \text{Bone} \]
Association Mapping
Association Mapping

- Function
- Environment
- Name
- Motion
- Used With
- Materials
**Association Mapping**

- **Heats**
- **Burns**
- **Smokes**
- **Counts down**
- **Pops!**

**Function**
- **Fire**
- **Bulb**
- **Wood burning tool**

**Environment**

**Name**

**Motion**

**Used With**

**Materials**
Association Mapping

- Function
- Environment
- Name
- Motion
- Used With
- Materials
Association Mapping

Name: Bread, Bagels, Coffee, Tea

Motion: Leaves, Cup, Kettle

Used With: Bread, Bagels, Coffee, Tea

Materials
Innovation is the application of new ideas or the combination of existing items in a novel way.
Association Mapping

- **Function**: Heats, Burns, Smokes, Counts down, Pops!
- **Environment**: Fire, Bulb, Wood burning tool
- **Name**: Toaster
- **Materials**: Used with
Innovation is the application of new ideas or the combination of existing items in a novel way.
Innovation is the application of new ideas or the combination of existing items in a novel way.

Crossing products is a strategy to generate innovative ideas.

\[
\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}
\]
Crossing Products
Crossing Products
Crossing Products

[Image of a figure] + [Image of a chair] = [Image of a green structure]
Crossing Products
Crossing Products
Crossing Products

Write down the name of three products

Exchange
Cross your 3 products with a pencil to make a new TOY PRODUCT!
Crossing Products

Write down the name of three products

Exchange

lamp
Cross your 3 products with a **lamp** to make a new **TOY PRODUCT!**
Crossing Products

my top **pencil** cross-product is: _______________________

- fantasy
- construction
- sensory
- challenge

and it could become: _______________________

- fantasy
- construction
- sensory
- challenge
Crossing Products

my top lamp cross-product is: _____________________

and it could become: ______________________

and it could become: ______________________
the secret theme is...
Pull Toys!
Pull Toys?
Teething Toy!

3 months plus

shapes to chew
easy to grasp
hardwood (maple)
no finish
Pull Toy?
Push Toy!

6 months plus (sitting)

cause and effect
hand grip

food safe finish
Wheelies!
Pull Toy?
Push Toy!

hand grip
food safe finish
hardwood (birch)

8 months plus (crawling)

heavier construction
Wheelies!

aluminum shaft and press nut
Pull Toy?
Pull Toy!

14+ months (toddler)
pull string
hardwood (walnut)

steel axels!
Push or Pull Toys
Pull or Push Toys

Wood blank sizes

0.75” x 7.5” x 10”

0.75” x 5.5” x 10”
Pull or Push Toys

Wood types

white pine
softwood, easy
dents and splits fairly easily

poplar
hardwood but soft!, easy
does not split easily
Pull or Push Toys

here’s wood!

splits along fibers!

longer, aligned fibers split more easily than shorter, interwoven fibers!!

does not split across fibers!!!
Pull or Push Toys

Rats (&$**!), it split

may the grain be with you!

choose the right wood
avoid short grain!
Pull or Push Toys

More wood types!

Maple
hardwood

Cherry
hardwood

Black walnut
hardwood

Red oak
hardwood
long fiber (splits)
Pull or Push Toys

Avoid shapes with hard to sand areas
2 hours!
You’ll need a design notebook!

Unruled

‘Diary’ sized or Larger
Next Class is Tuesday!

Theme
Innovation & Ideation

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