Innovation & Ideation

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

Available Now
Team communication

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

200b-tiger@mit.edu
It's a special week!
It’s a special week!
It’s a special week!
Children’s Museum Visit!

Meet at the Boston’s Children Museum at 6:30 PM Friday

Optional, FREE!, introduction to the children’s museum

Red line to South Station

Explore!
To Be Toy Designers...

you!
Eyes of a Child!
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.
While the intended audience is children, the customers buying the toys are their parents

- Delace Jia
Who is our Customer?

Influence on Product Selection

Product Use

user  purchaser  producer

retailer

Influence on Product Selection
What is play? Play is using creative freedoms to entertain yourself
- Anna Meurer
Play is a state of mind
What is the opposite of play?

chore  work = IIII  IIII  IIII  IIII  IIII  IIII  IIII

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

“behavior that causes sadness or harm” - Matt Jens

“forced drudgery” - Zawad Chowdhury

“any MIT final exam” - Jacob Rodriguez
What is the opposite of play?

The opposite of play is clean-up time. It brings immense sadness, but results in clean carpets.

- John Graham
What is the opposite of play?

doing quizzes

- Katana Finlason
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 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, Anterior Superior Temporal Sulcus (ASTS)
“Aha!” Experience (Jung-Beeman 2004)

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)
Ideation techniques

**Free Form or Intuitive Methods**

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

- **Free Writing**

- **Brainstorming**

**Structured or Logical Methods**

- **TRIZ**
- **ARIZ**
- **ASIT**
- **SCAMMPER**

- **Morphological Analysis**
- **Attribute Listing**
- **Potential Problem Analysis**
- **FRDPARRC**

**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**

**Associations Techniques**

- **Provocation**
- **BruteThink**
- **Analogies**
- **Force Fit**
- **Bunches of Bananas**
- **Excursions**
- **Mind Mapping**
- **Free Association**
- **Association Mapping**
**Associations**

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

- **names of coffee**: joe, java
- **actions related to coffee**: sipping, spilling, staining, drinking, burning, break
- **types of coffee**: black, decaffeinated, espresso, latte
- **served with coffee**: donuts, breakfast, newspaper
- **properties of coffee**: caffeine, diuretic, hot, acidic
- **things that go in coffee**: milk, cream, dairy, sugar, stirrer, coffee beans, water
- **places related to coffee**: dunkin donuts, starbucks, kitchen, south america
- **products related to coffee**: coffee maker, mug, coffee machine, grinder, tea
- **“breaks will no longer be dictated by time to finish your coffee”**
- **“who ordered from Java the Hutt?”**
- **“the sink’s full again”**
- **“coffee sales have been soaring”**
- **“is this the decaf?”**
- **“where’s the bathroom?!”**
- **“the crullers will be here shortly, as soon as they take the door off the hinge”**
- **“coffee sales have been soaring”**
Association Mapping

Meanings

lazy
loose

slack line

rope
Association Mapping

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

Column → *Functional requirement:*

Structural support → 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

Motion

Name

Materials
Association Mapping

Function

Environment

Name

Motion

Used With

Materials
Association Mapping

- Name: Leaves, Cup, Kettle
- Motion: Bread, Bagels, Coffee, Tea
- Used With: Materials

Diagram showing associations between items used in a morning routine.
Association Mapping

Function

Environment

Name

Motion

Used With

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!

Fire
Bulb
Wood burning tool

Motion

Environment

Name

Materials

Associated used with:
- Heats
- Burns
- Smokes
- Counts down
- Pops!

Function:
- Fire
- Bulb
- Wood burning tool

Environment:

Name:

Materials:
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.

\[ \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix} \]
Crossing Products
Crossing Products
Crossing Products
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
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: ______________________
the secret theme is...

lab this week!
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)
- Heavier construction

8 months plus (crawling)
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!
For Next Week

You’ll need a design notebook!

Unruled

‘Diary’ sized or Larger
Innovation & Ideation

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