Brainstorming, Ideation, and Design
Elijah Wiegmann

Founder Base Design Studio
4moms Design Director
Michael Graves Design Group
What is “design thinking”? 
Designers like ambiguity
WE'RE SENSITIVE ARTISTS
We’re sensitive artists

“That Blue isn’t blue enough”
It’s actually a bit more Cerulean than Teal

“What if it wasn’t?”
Blow it up! Get it out of my face!

“Does it have to be like that?”
I just, like... don’t get it
But we're also Canaries

This is the part where you get sensitive...

Have you actually tested?
Do you want the truth?
Are your costs in-line?
What's it made out of?
Who can help us?
Does it work?
Does anyone even want it?
I. EMPATHIZE
Develop a deep understanding of the challenge

II. DEFINE
Clearly articulate the problem you want to solve

III. IDEATE
Brainstorm potential solutions
Select and develop your solution

IV. PROTOTYPE
Design a prototype (or series of prototypes) to test all or part of your solution

V. TEST
Engage in a continuous short-cycle innovation process to continually improve your design
WHAT IF...?
Test quickly
FOCUS
Exercises
CONNECTIONS

https://blog.hubspot.com/marketing/creative-exercises-better-than-brainstorming
THAT MAKES ME THINK OF...

https://blog.hubspot.com/marketing/creative-exercises-better-than-brainstorming
WISHING...

It would be so much easier if we didn’t have to worry about (x)...
Iterate (refine)
KNOWING THE CONSTRAINTS!
Charles Eames
“Here is one of the few effective keys to the design problem — the ability of the designer to recognize as many of the constraints as possible — his willingness and enthusiasm for working within these constraints. Constraints of price, of size, of strength, of balance, of surface, of time and so forth.”

— Charles Eames
Study the Constraints... (and tell them to everyone)
Without prototyping, you can’t make an educated choice about which ideas to pursue. The purpose of any prototype is to test a concept before committing time and resources.
WHY PROTOTYPE?

Design
"Branching Exploration"

Prototyping
"Incremental iterative refinement"

Bill Buxton, Sketching User Experiences
SELL AN IDEA
AUDIENCE: CLIENTS
GOAL: CLIENT PRESENTATION

USER TESTING
AUDIENCE: USERS
GOAL: DEMO THE PRODUCT

PROOF OF CONCEPT
AUDIENCE: INTERNAL TEAM
GOAL: COLLABORATION

TEST LOGIC
AUDIENCE: INTERNAL TEAM
GOAL: VALIDATION
This stage isn’t about exactly how to make it. Don’t let that stop you!
The best overview of prototypes ever

iD Cards– Loughborough University, 2009

Download the pdf and app

http://www.lboro.ac.uk/media/wwwlboroacuk/external/content/schoolsanddepartments/designschool/downloads/id-cards%20(1).pdf
1. Idea Sketch
   - Employed at a personal level to quickly externalise thoughts using simple line-work. Also known as a Thumbnail, Thinking or Napkin Sketch.

2. Study Sketch
   - Used to investigate appearance, proportion and scale in greater detail than an Idea Sketch. Often supported by the loose application of tone/colour.

3. Referential Sketch
   - Used to record images of products, objects, living creatures or any relevant observations for future reference or as a metaphor.

4. Memory Sketch

5. Coded Sketch

6. Information Sketch
4 Memory Sketch
Helps expand thoughts during the design process using mind maps, notes and annotations.

5 Coded Sketch
Informal coded representation that categorises information to demonstrate an underlying principle or scheme.

6 Information Sketch
Quickly and effectively communicates features through the use of annotation and supporting graphics. Also known as an Explanatory or Talking Sketch.

7 Sketch Rendering

8 Prescriptive Sketch
Sketches

7 Sketch Rendering

Clearly defined proposal produced by controlled sketching and use of colour/tone to enhance detail and realism. Also known as a First Concept.

8 Prescriptive Sketch

Informal sketch for the exploration of technical details such as mechanisms, manufacturing, materials and dimensions.
Scenario & Storyboard

Describes interaction between user and product, sometimes in an appropriate context.

Layout Rendering

Defines the product proposal as a third angle orthographic projection with precise line and colour.

Id Cards
### 11. Presentation Rendering

Contains a high level of realism to fully define product appearance as a perspective view. Particularly useful for decision making by non-designers.

### 12. Diagram

Schematic representation of the operating principle or relationship between components. Also known as a Schematic or Diagrammatic Drawing.

### 13. Perspective Drawing

Descriptive three-quarter view produced using a perspective drawing technique. Created using lines only without the application of colour or tone.

### 14. General Arrangement

### 15. Detail

### 16. Technical
14 General Arrangement Drawing

15 Detail Drawing

16 Technical Illustration
Models

17 Sketch Model
Informal, relatively low definition 3D model that captures the key characteristics of form. Also known as a Foam Model or 3D Sketch.

18 Design Development Model
Simple mock-up used to explore and visualise the relationships between components, cavities, interfaces and structures. Usually produced using card.

19 Functional

20 Operational

21 Appearance
<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>19</td>
<td>Functional Model</td>
<td>Captures the key functional features and underlying operating principles.</td>
</tr>
<tr>
<td>20</td>
<td>Operational Model</td>
<td>Communicates how the product is used with the potential for ergonomic evaluation.</td>
</tr>
<tr>
<td>21</td>
<td>Appearance Model</td>
<td>Accurate physical representation of product appearance. Also known as a Block Model as it tends not to contain any working parts.</td>
</tr>
<tr>
<td>22</td>
<td>Assembly</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Production</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Service</td>
<td></td>
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</tbody>
</table>
22 Assembly Model

 Enables the evaluation and development of the methods and tools required to assemble product components.

23 Production Model

 Used to evaluate and develop the location and fit of individual components and sub-assemblies.

24 Service Model

 Supports the development and demonstration of how a product is serviced and maintained.
25 Experimental Prototype

Refined prototype that accurately models physical components to enable the collection of performance data for further development.

26 Alpha Prototype

Brings together key elements of appearance and functionality for the first time. Uses or simulates production materials.

27 Beta Prototype

A refined evolution of an Alpha Prototype used to evaluate ongoing design changes in preparation for the final specification of all components.
31 Appearance Prototype

Highly detailed representation that combines functionality with exact product appearance. Uses or simulates production materials.

32 Pre-Production Prototype

Final prototype produced using production components. Manufactured in small volumes for testing prior to full scale production.

Prototypes
Start drawing

Mind maps, flow charts, idea sketches,
Physical Prototypes
Build it (craft Time)
<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>5/8&quot; x 1&quot;</td>
<td>$1.05</td>
</tr>
<tr>
<td>5/8&quot; x 1-1/2</td>
<td>$1.25</td>
</tr>
<tr>
<td>1/4&quot; x 1&quot;</td>
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<tr>
<td>1/4&quot; x 1-1/2</td>
<td>$0.85</td>
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<td>5/16&quot; x 1&quot;</td>
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</tbody>
</table>

*Off-The-Shelf*
Buy Things that are similar and take them apart!
Cardboard

Paper, Tape, Staples, scissors
Sculpey, Clay, Play-doh

Model the whole shape, or just use to refine curves
They even design cars in clay!
FOAM

Green or pink foam insulation at Home Depot

High Density Carving Foam
Softgoods prototyping

Paper, Tape, Staples, scissors
Softgoods prototyping

Fabric

If you can’t sew, use staples or tape
Next Level Prototypes
CAD Model

Computer Assisted Design

Solidworks, pro E, Rhino

50 hrs + Specialized expertise
Computer Renderings

Photorealistic models

Agree on Colors, materials, textures.

Logo Placement branding
3D PRINTING

Amazing resolution

Should be late in the process
Painted appearance model

Complete model

Size, shape, color

Sometimes working
Invisible Prototypes
Acting it out

Great for services, processes, and interactions
7-14-28

Make a peanut butter sandwich in 7 steps. Then make it in 14. Then in 28.

Continue to delve deeper to understand connections and get new insights.
SCALE!
SCALE

PROTOTYPES DON’T ALWAYS HAVE TO BE IN SCALE.

WORKING 1:1 DOES HELP UNDERSTANDING MUCH DEEPER THOUGH.
SCALE

If your concept is a display, stand, or area, tape it off.

Live in it... Act out interactions...
HUMAN SCALE

HUMANS WILL USE YOUR PRODUCT SO START MAKING THEM HOLD IT.

TAPE IT TO THEM!

PUT IT IN A BOX AND HAVE THEM OPEN IT AND ASSEMBLE
Get it in people’s hands
You know who knows how to Break stuff?
Have hard conversations. Be honest.
Talk to the Vendor
You know who knows how to make stuff?
2 ABSOLUTES OF PROTOTYPES

1. There is no set number of prototypes you should make... **But it is definitely more than one.**
2 ABSOLUTES OF PROTOTYPES

1. There is no set number of prototypes you should make... But it is definitely more than one.

2. Each prototype will teach you something... usually it will make your design better.
Left turn!
Elijah’s guide to making things real (and real good)
ALIGNMENT
(LINE THINGS UP)
ALIGNMENT
(Line Things up)
Beauty Gap
Beauty Gap
Beauty Gap
Pick one thing to celebrate
Combine Pieces
Use Multiple Materials
Use Softgoods
Play with Scale
I. EMPATHIZE
Develop a deep understanding of the challenge

II. DEFINE
Clearly articulate the problem you want to solve

III. IDEATE
Brainstorm potential solutions
Select and develop your solution

IV. PROTOTYPE
Design a prototype (or series of prototypes) to test all or part of your solution

V. TEST
Engage in a continuous short-cycle innovation process to continually improve your design
Thank You!
Go Make something great!
Questions?

Elijah@Basedesignco.com