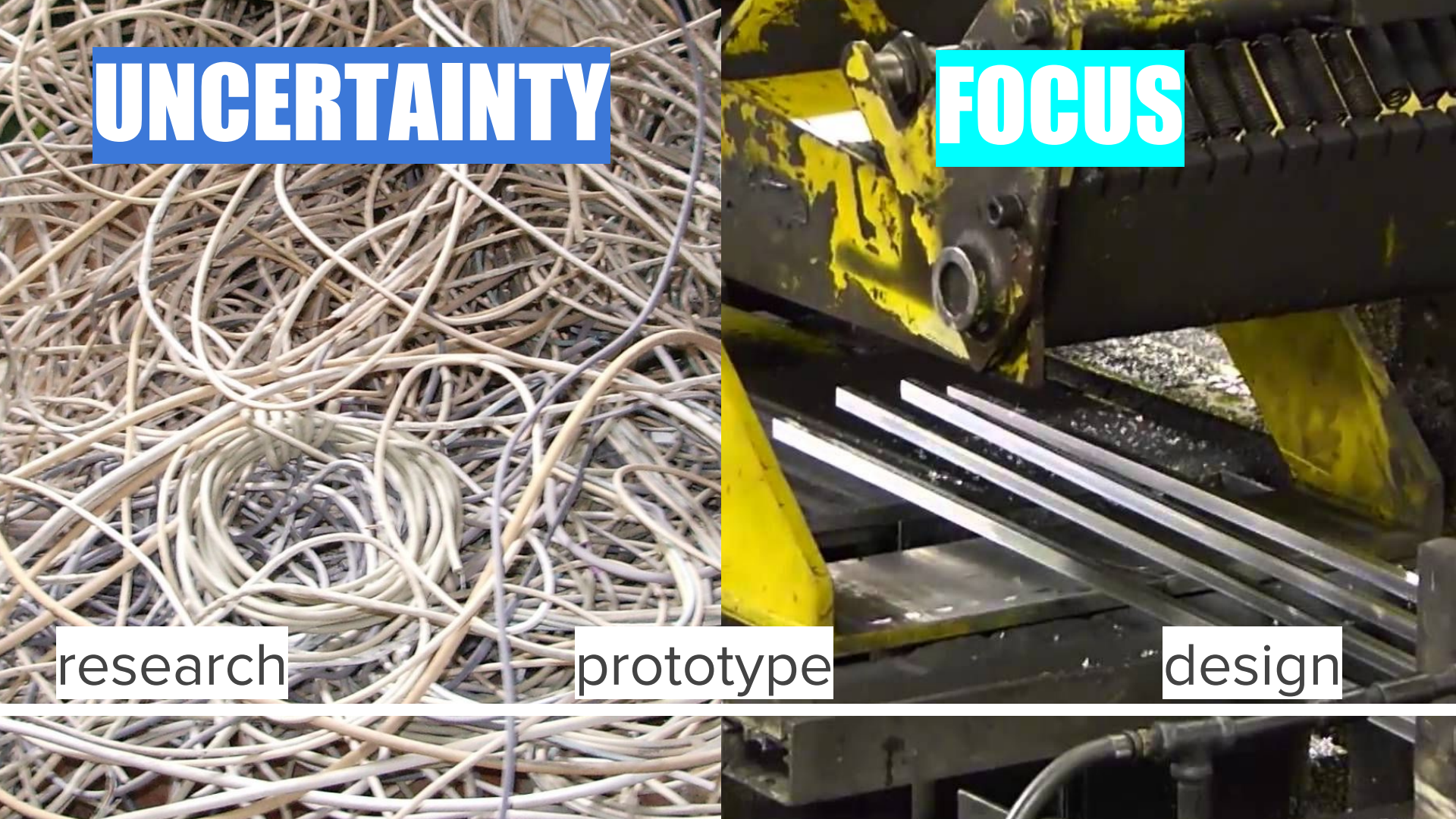
Designing at Super Speed

Elijah Wiegmann

Founder Base Design Studio

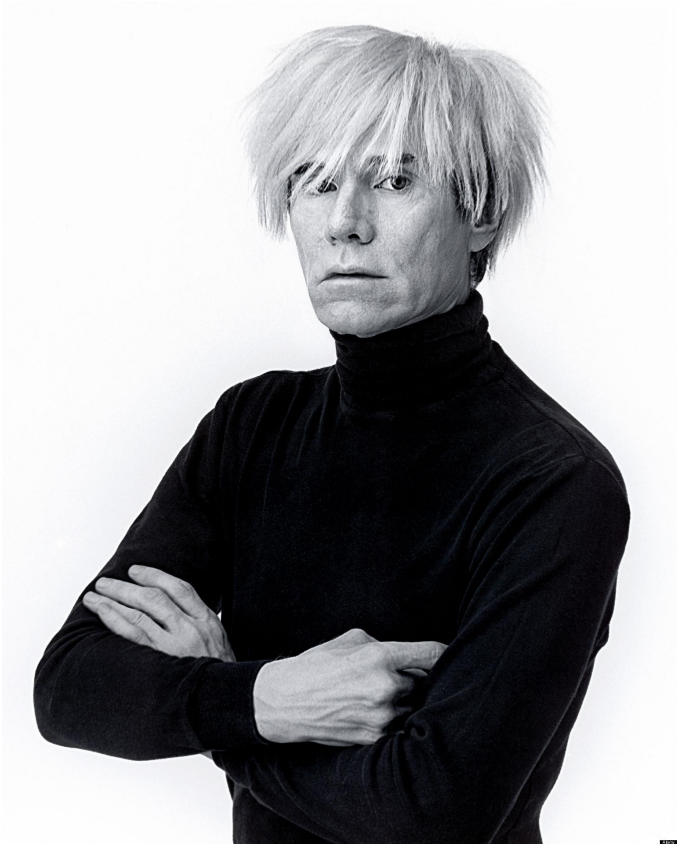
BASE DESIGN STUDIO

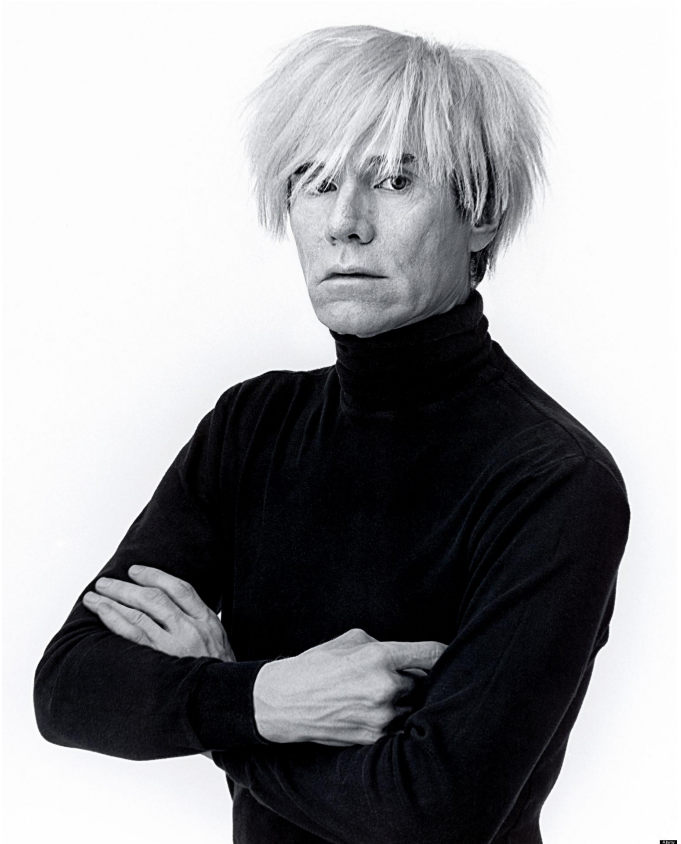
What is "design thinking" ?


UNCERTAINTY
FOCUS
research
prototype
design

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

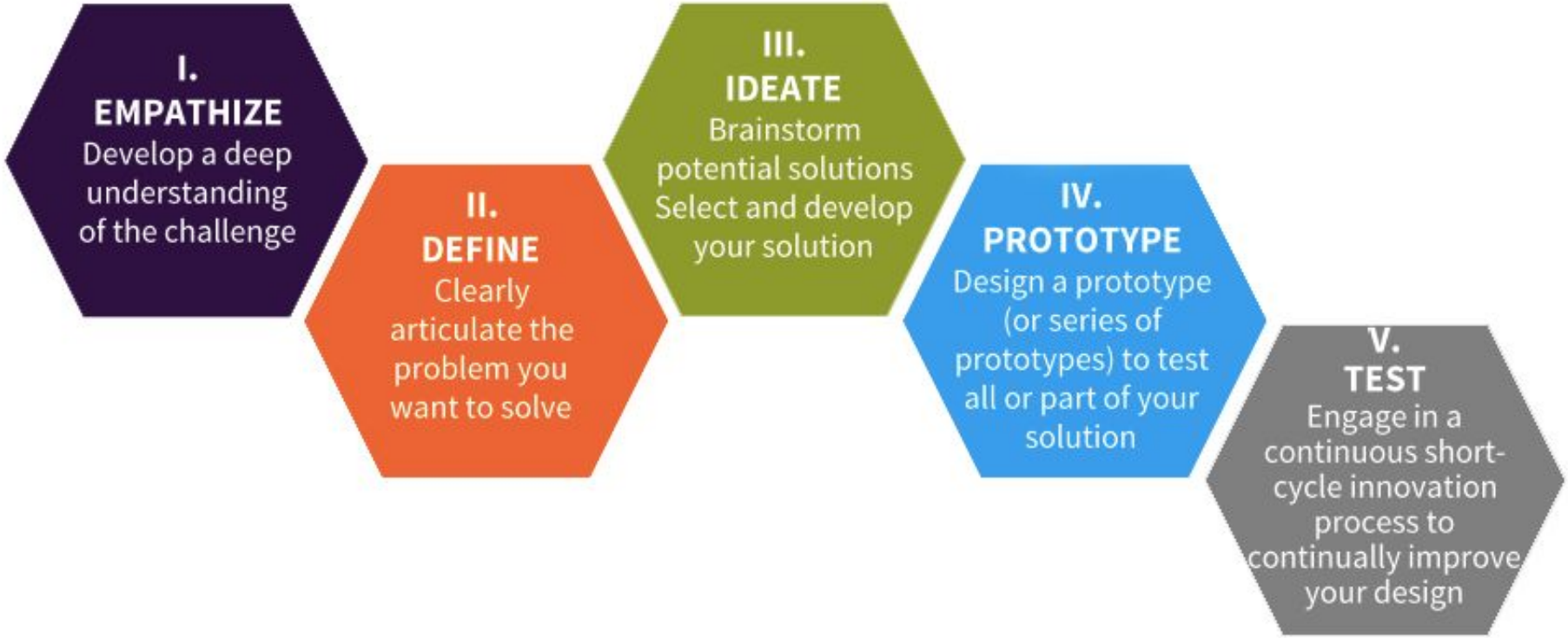
But we're also Canaries

This is the part where you get sensitive...

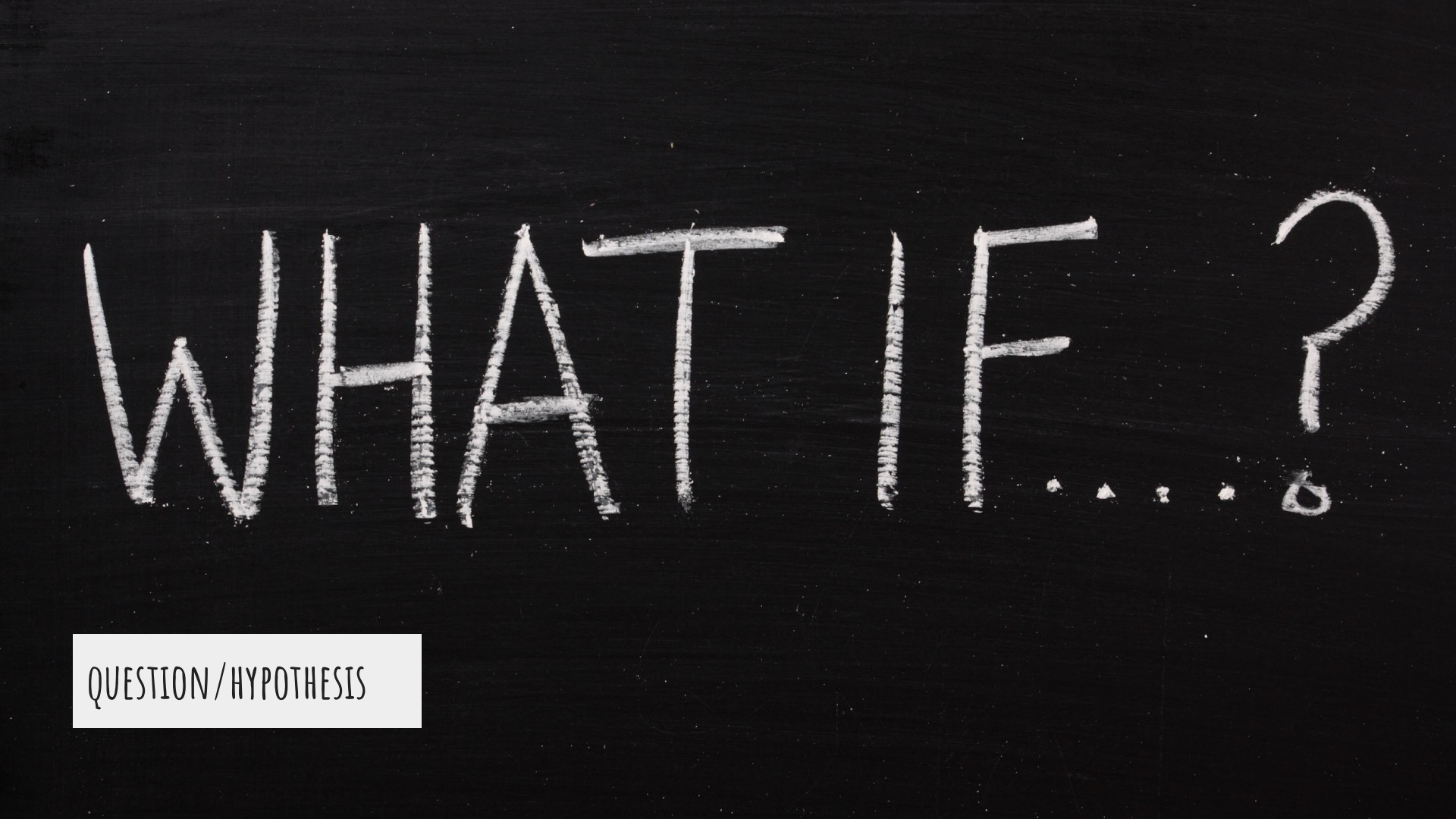
Have you actually tested?
Do you want the truth?
Are your costs in-line?
What's it made out of?
Who can help us?
Does it work?
Does anyone even want it?

The Process

BASE
DESIGN STUDIO



BASE
DESIGN STUDIO



QUESTION/HYPOTHESIS


Test quickly


ITERATE


FOCUS

Exercises

question/hypothesis

STORYBOARDING

THAT MAKES ME THINK OF...

CONNECTIONS

WISHING

S.C.A.M.P.E.R

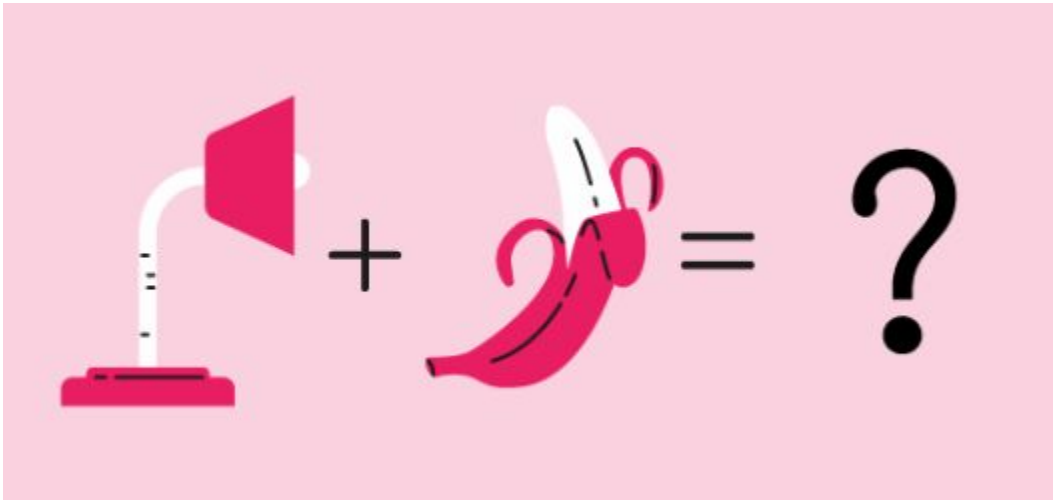
ZERO DRAFT

BRAIN WRITING

QUESTION/HYPOTHESIS

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

CONNECTIONS



QUESTION/HYPOTHESIS

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

THAT MAKES ME THINK OF...

QUESTION/HYPOTHESIS

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

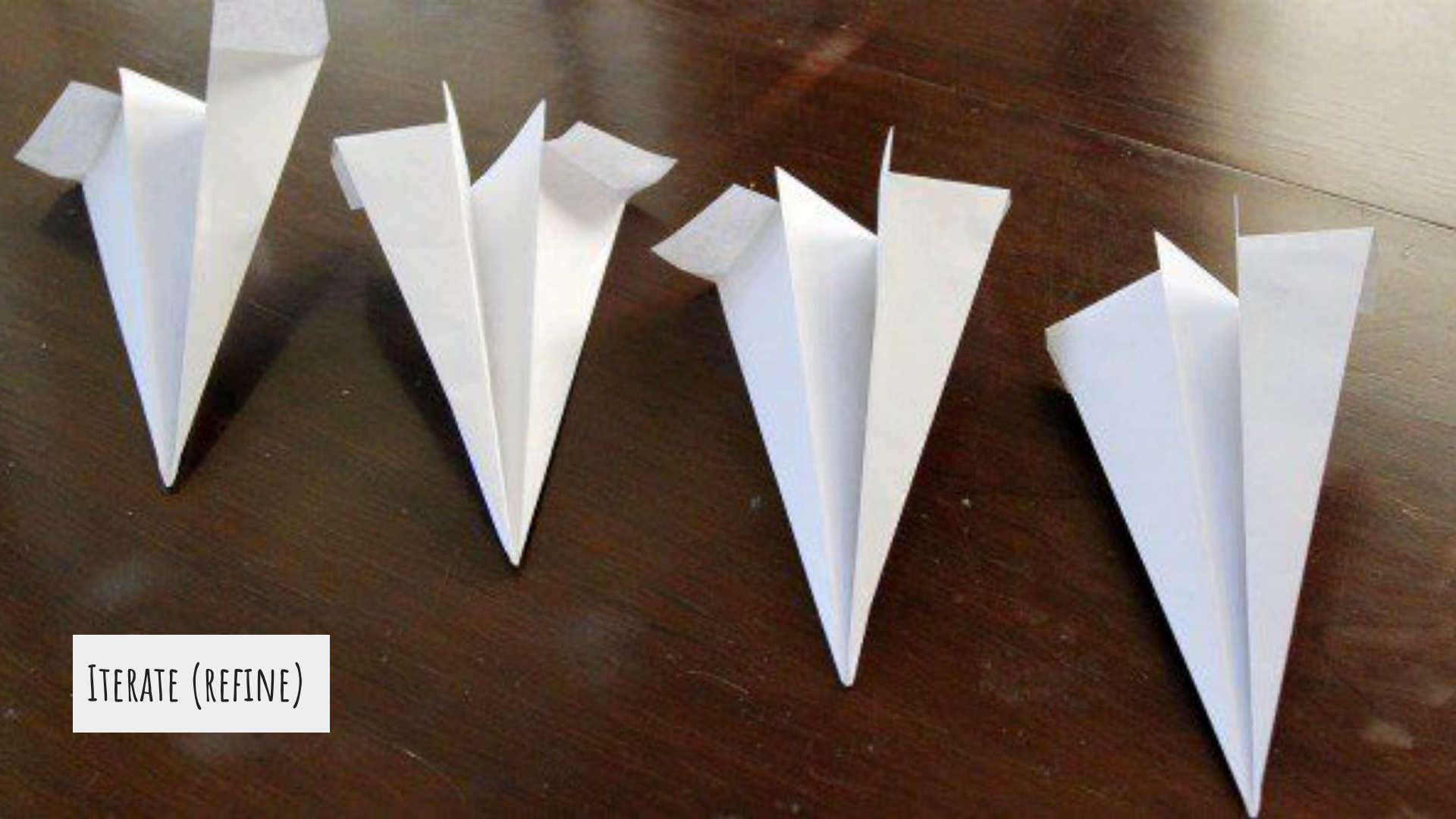
WISHING...

It would be so much easier if we didn't have to worry about (x)...

question/hypothesis

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


Test Quickly


Iterate (refine)


Focus

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."

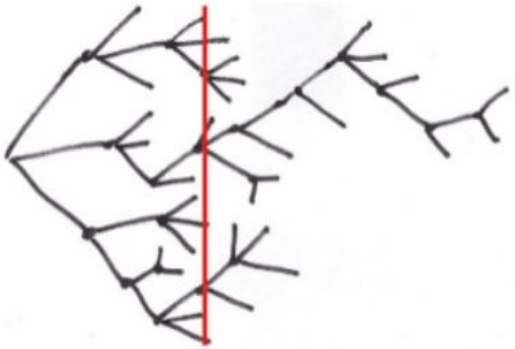
— CHARLES EAMES

Study the Constraints... (and tell them to everyone)

Prototyping to sort, Organize and filter

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.

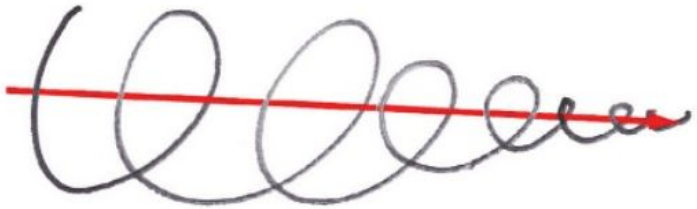
WHY PROTOTYPE?



Design

"Branching Exploration"

v



Prototyping

"Incremental iterative refinement"

Bill Buxton, Sketching User Experiences

HIGH FIDELITY

SELL AN IDEA

AUDIENCE: CLIENTS
GOAL: CLIENT PRESENTATION

USER TESTING

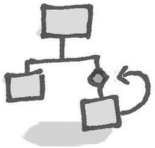
AUDIENCE: USERS
GOAL: DEMO THE PRODUCT

PARTIAL

COMPLETE

PROOF OF CONCEPT

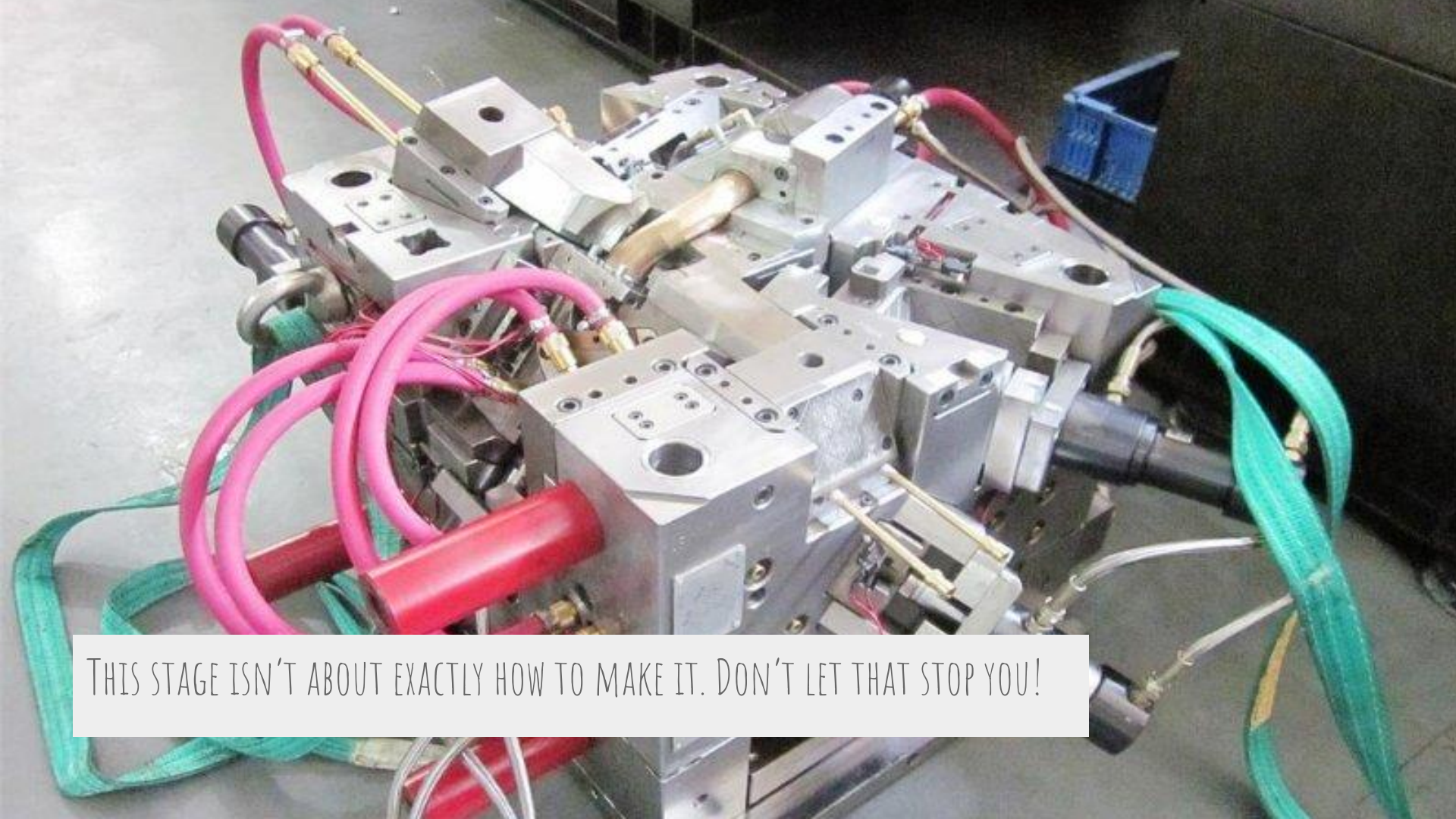
AUDIENCE: INTERNAL TEAM
GOAL: COLLABORATION



TEST LOGIC

AUDIENCE : INTERNAL TEAM
GOAL: VALIDATION

LOW FIDELITY



This stage isn't about exactly how to make it. Don't let that stop you!

The best overview of prototypes ever

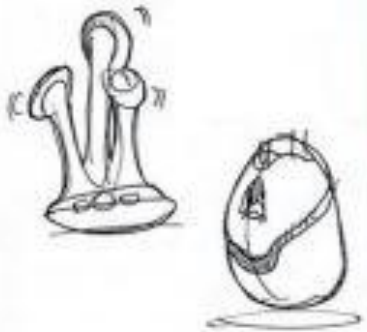
iD Cards- Loughborough University, 2009

Download the pdf and app

http://www.lboro.ac.uk/media/wwwlboroacuk/external/content/schoolsanddepartments/designschool/downloads/id-cards%20(1).pdf

Concept
Development
Embodiment
Detail
Design Intent

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.

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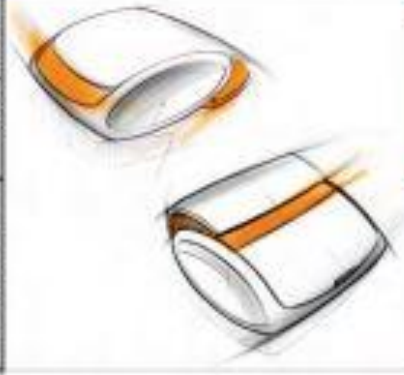
Concept
Development
Embodiment
Detail
Form

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.

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Concept
Development
Embodiment
Detail
Visual Character

3 Referential Sketch

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

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Concept
Development
Embodiment
Detail
Design Intent

4 Memory Sketch

Concept
Development
Embodiment
Detail
Form

5 Coded Sketch

Concept
Development
Embodiment
Detail
Visual Character

6 Information Sketch

Concept
Development
Embodiment
Detail

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Concept
Development
Embodiment
Detail

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Concept
Development
Embodiment
Detail

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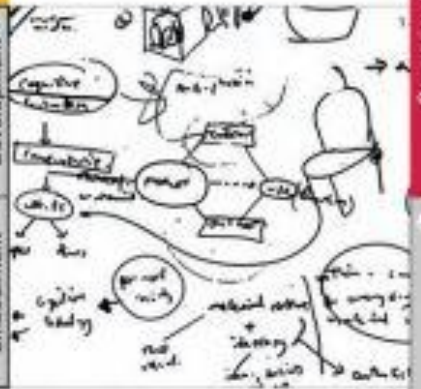
Concept
Development
Embodiment
Detail
Scenario of Use

4 Memory Sketch



Helps expand thoughts during the design process using mind maps, notes and annotations.

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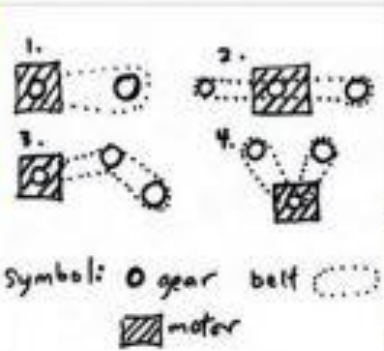
Concept
Development
Embodiment
Detail
Components

5 Coded Sketch



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

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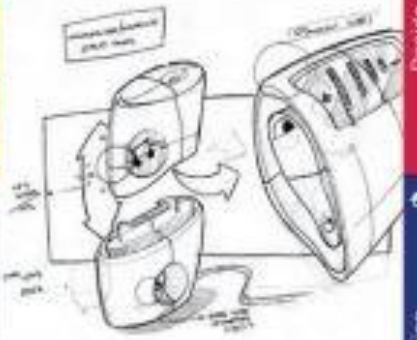
Concept
Development
Embodiment
Detail
Design Intent
Construction

6 Information Sketch



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

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Sketches

Concept

7 Sketch

Concept

8 Prescriptive

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Sketches

iD CARDS

Concept

Development

Embodiment

Detail

Form

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.

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Concept

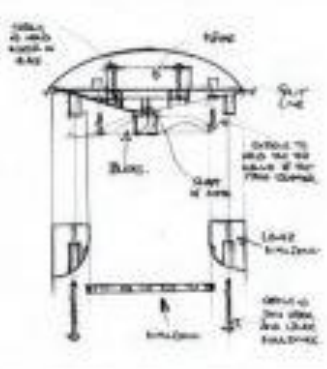
Development

Embodiment

Detail

Components

8 Prescriptive Sketch



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

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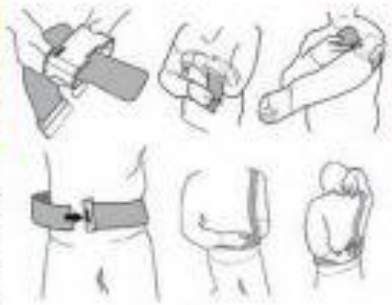
Concept
Development
Embodiment
Detail

9
Scenario & Storyboard



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

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Scenario of Use

Concept
Development
Embodiment
Detail

10
Layout Rendering

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

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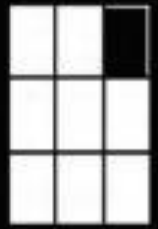
Form
Components

Drawings



iD CARDS

Concept

11

Concept

12

Concept

13

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CARDS

Concept
Development
Embodiment
Detail
Form

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.

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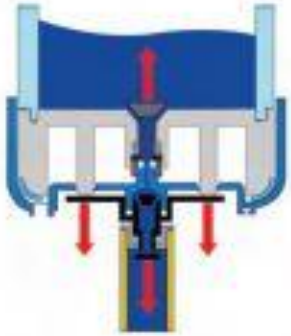
12 Diagram



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

Components

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13 Perspective Drawing

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

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14 General Arrangement

15 Detail

16 Technical

perspective view. Particularly useful for decision making by non-designers.

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between components. Also known as a Schematic or Diagrammatic Drawing.

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Created using line only without the application of colour or tone.

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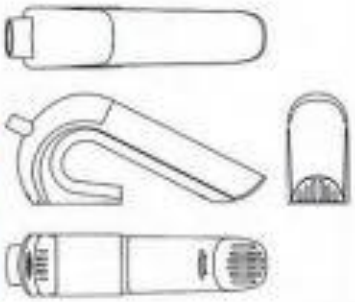
Concept
Development
Embodiment
Detail

14 General Arrangement Drawing



Exterior view of all components using line only and with sufficient detail to produce an Appearance Model if required. Usually drawn in third angle projection.

Components

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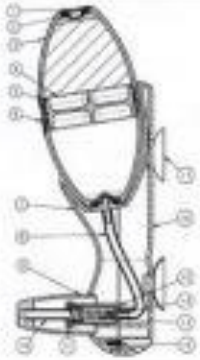
Concept
Development
Embodiment
Detail

15 Detail Drawing



Contains detail of components for the manufactured product. Also known as a Technical, Production or Construction Drawing.

Dimensions

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Concept
Development
Embodiment
Detail

16 Technical Illustration

Communicates technical detail with a high degree of realism that is sometimes supported with symbols. Includes exploded views.

Components

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Models

iD CARDS

Concept
Development
Embodiment
Detail

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.

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Form

Concept
Development
Embodiment
Detail

18 Design Development Model

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

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Areas of Concern
Components

Concept

19 Functional

Concept

20 Operational

Concept

21 Appearance

CARDS

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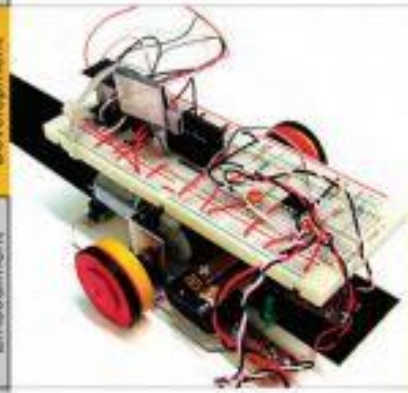
Loughborough University

Concept
Development
Embodiment
Detail
Performance

19 Functional Model



Captures the key functional features and underlying operating principles. Has limited or no association with the product's final appearance.

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Concept
Development
Embodiment
Detail
Usability & Operation

20 Operational Model

Communicates how the product is used with the potential for ergonomic evaluation.

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Concept
Development
Embodiment
Detail
Form

21 Appearance Model

Accurate physical representation of product appearance. Also known as a Block Model as it tends not to contain any working parts.

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Concept

22 Assembly

Concept

23 Production

Concept

24 Service

Has limited or no association with the product's final appearance.

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Concept | Development | Embodiment | Detail | Pe

used with the potential for ergonomic evaluation.

Loughborough University

Concept | Development | Embodiment | Detail | Pe

product appearance. Also known as a Block Model as it tends not to contain any working parts.

Loughborough University

Concept | Development | Embodiment | Detail | Pe

22 Assembly Model

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

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Concept | Development | Embodiment | Detail | Assembly

23 Production Model

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

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Concept | Development | Embodiment | Detail | Construction

24 Service Model

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

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Concept | Development | Embodiment | Detail | Assembly

Concept
Development
Embodiment
Detail
Performance

25 Experimental Prototype

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

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Concept
Development
Embodiment
Detail
Construction

26 Alpha Prototype

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

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Concept
Development
Embodiment
Detail
Usability & Operation
Construction

27 Beta Prototype

A refined evolution of an Alpha Prototype used to evaluate on-going design changes in preparation for the final specification of all components.

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models physical components to enable the collection of performance data for further development.

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Concept | Development | Embodiment | Detail | Performance

appearance and functionality for the first time. Uses or simulates production materials.

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Concept | Development | Embodiment | Detail | Performance

used to evaluate on-going design changes in preparation for the final specification of all components.

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Concept | Development | Embodiment | Detail | Performance

28
System Prototype

Integrates components specified for the production item without consideration of appearance. Used to evaluate electronic and mechanical performance.

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Concept | Development | Embodiment | Detail | Performance

29
Final Hardware Prototype

Developed from the System Prototype as a final representation of the product's functional elements.

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Concept | Development | Embodiment | Detail | Performance

30
Off-Tool Component

Produced using the tooling and materials intended for production to enable the evaluation of material properties and appearance of components.

Loughborough University

Concept | Development | Embodiment | Detail | Materials

31

32

and mechanical performance.

Loughborough University

Loughborough University

appearance of components.

Loughborough University

Concept
Development
Embodiment
Detail

Design Intent
Performance

31 Appearance Prototype

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

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Concept
Development
Embodiment
Detail

Performance

32 Pre-Production Prototype

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

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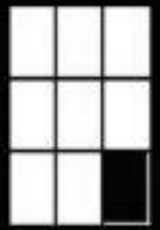
Prototypes

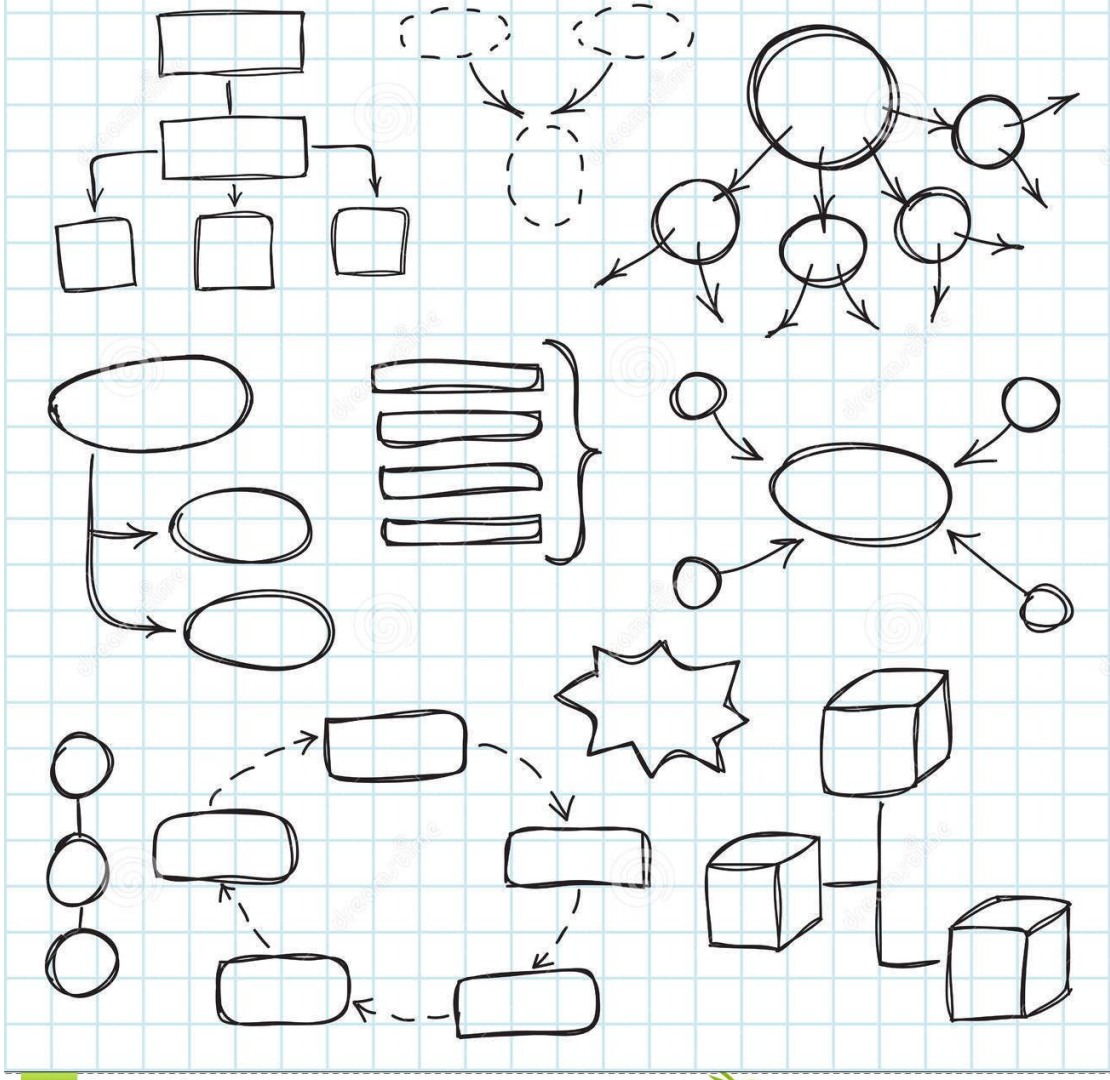


iD CARDS

Drawing

Start drawing

Mind maps, flow charts, idea sketches,



Physical Prototypes

Build it (craft Time)


Hex Nut
Carriage Bolt
Lag Screw
Eye Bolt with Nut
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

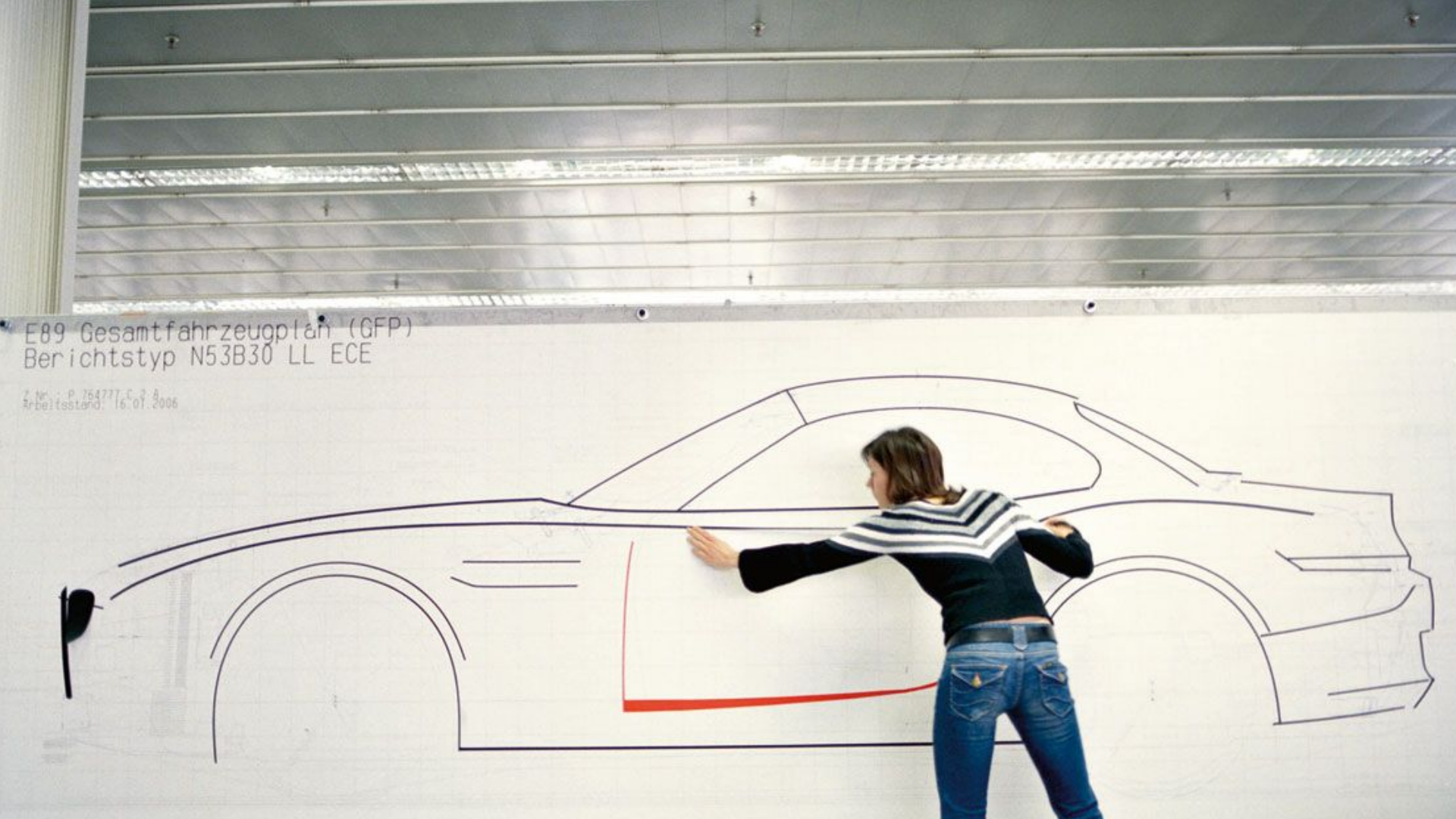
PROTOTYPES DON'T ALWAYS HAVE TO BE IN SCALE.

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...


E89 Gesamtfahrzeugplan (GFP)
Berichtstyp N53B30 LL ECE

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

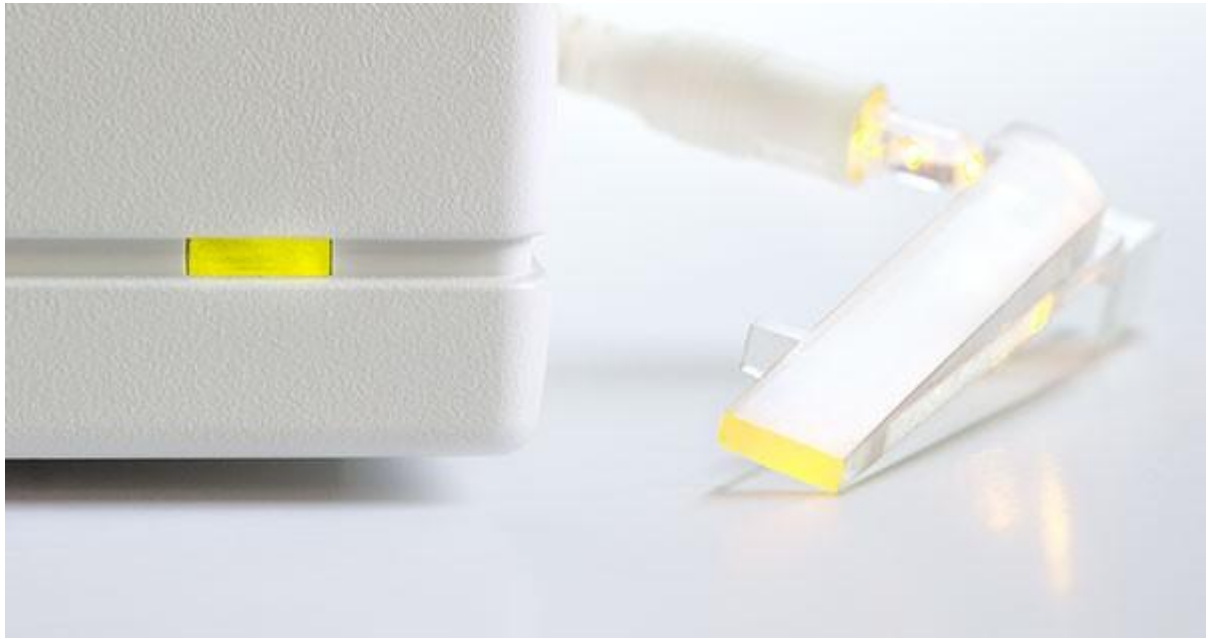
(and real good)

Alignment
(Line Things up)

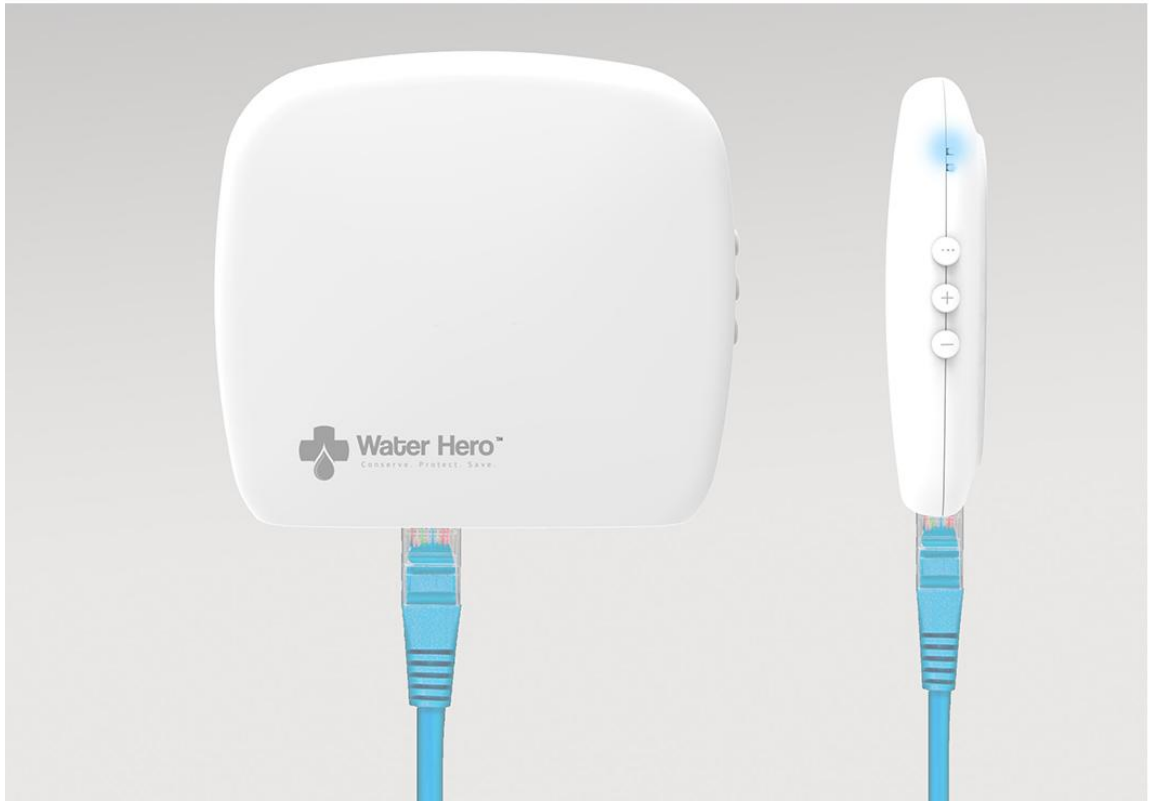
Alignment (Line Things up)

Beauty Gap

Beauty Gap



Beauty Gap



Beauty Gap

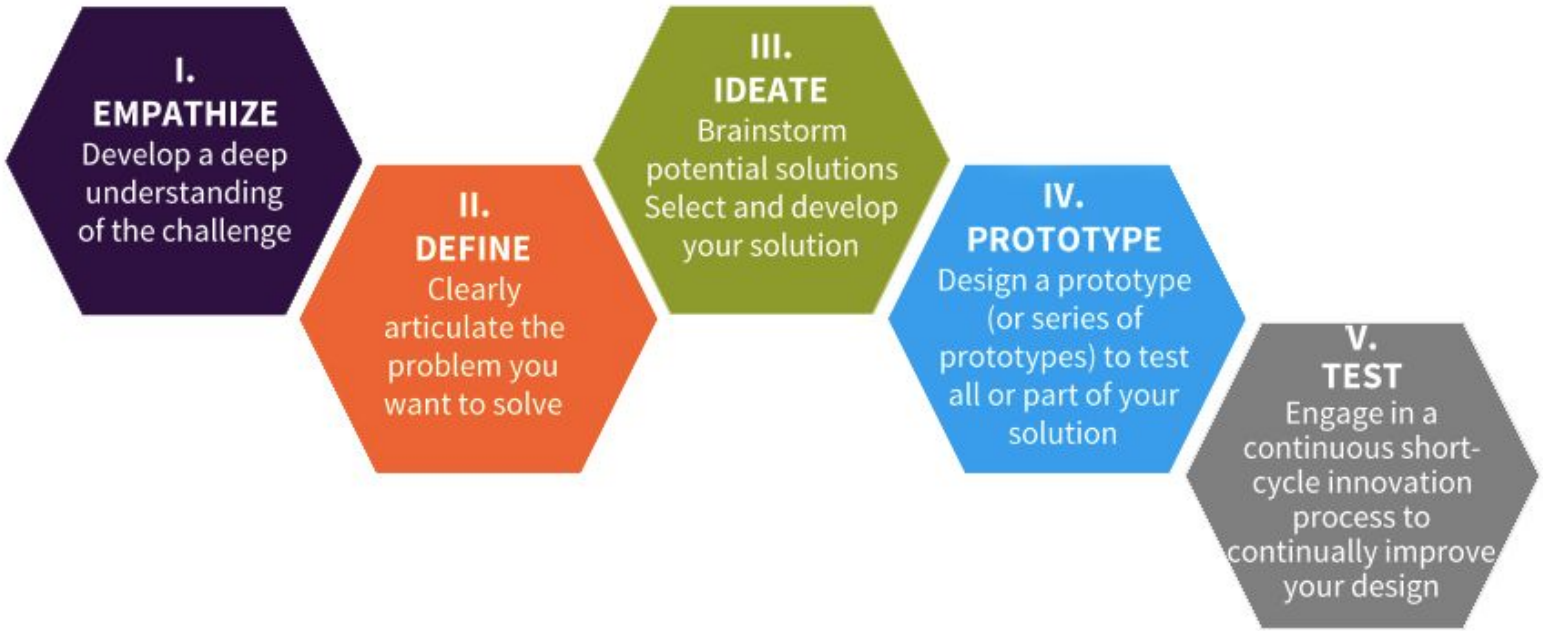
Pick one thing to celebrate

Combine Pieces

Use Multiple Materials

Use Softgoods

Play with Scale



BASE
DESIGN STUDIO

Thank You!
Go Make something great!

Questions?

Elijah@Basedesignco.com