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# Design Thinking for Programming Professionals

Using the Five Design-Sheet Methodology

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*“However, don't let  
perfectionism become  
an excuse for never  
getting started”*

Marilu Henner

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- Degree in Design and Education.
- PGCertHE and PTLLS
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# Today

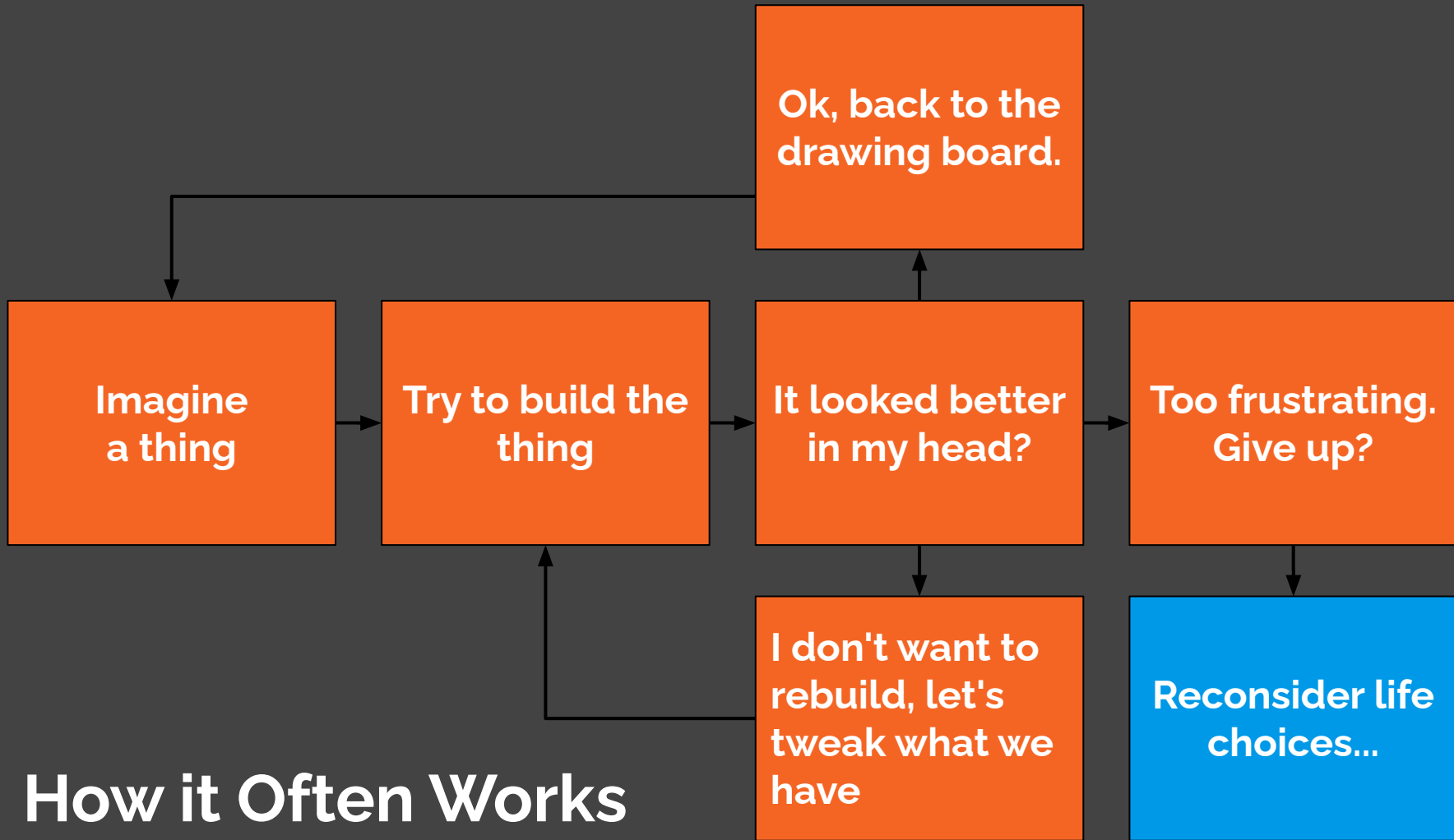
1. The design and development pipeline.
2. The diamond approach to design.
3. The FdS... What is it?
4. Implementing the FdS for user interface design.
5. 6 Thinking Hats.

# Meet Bob

Bob knows how to code, he is competent in JavaScript and HTML and more than happy to develop back-end systems.

Bob now needs to develop a front-end that users will interact with. However, he isn't a designer by trade and doesn't know how to work through his ideas.

Bob is visibly confused...



# How it Often Works

# Creating Applications

**Think**

**?**

**Design**

**?**

**Build**

**?**

**Evaluate**

**?**

# Creating Applications



## Code n' Stuff

HTML

Javascript

C++

Agile

Prototyping

Etc...



# Creating Applications

**Build**



## Code n' Stuff

HTML  
Javascript  
C++  
Agile  
Prototyping  
Etc...

**Evaluate**



## Questions n' Tests

Blackbox  
Unit  
Alpha and Beta  
SUS  
UEQ

# Creating Applications



## Ideation

6 Thinking Hats  
Problem Solving

... less tools generally available, but we often start with some idea of what we need.



## Ideation

Sketching?  
Wireframes?  
UML?



## Code n' Stuff

HTML  
Javascript  
C++  
Agile  
Prototyping  
Etc...



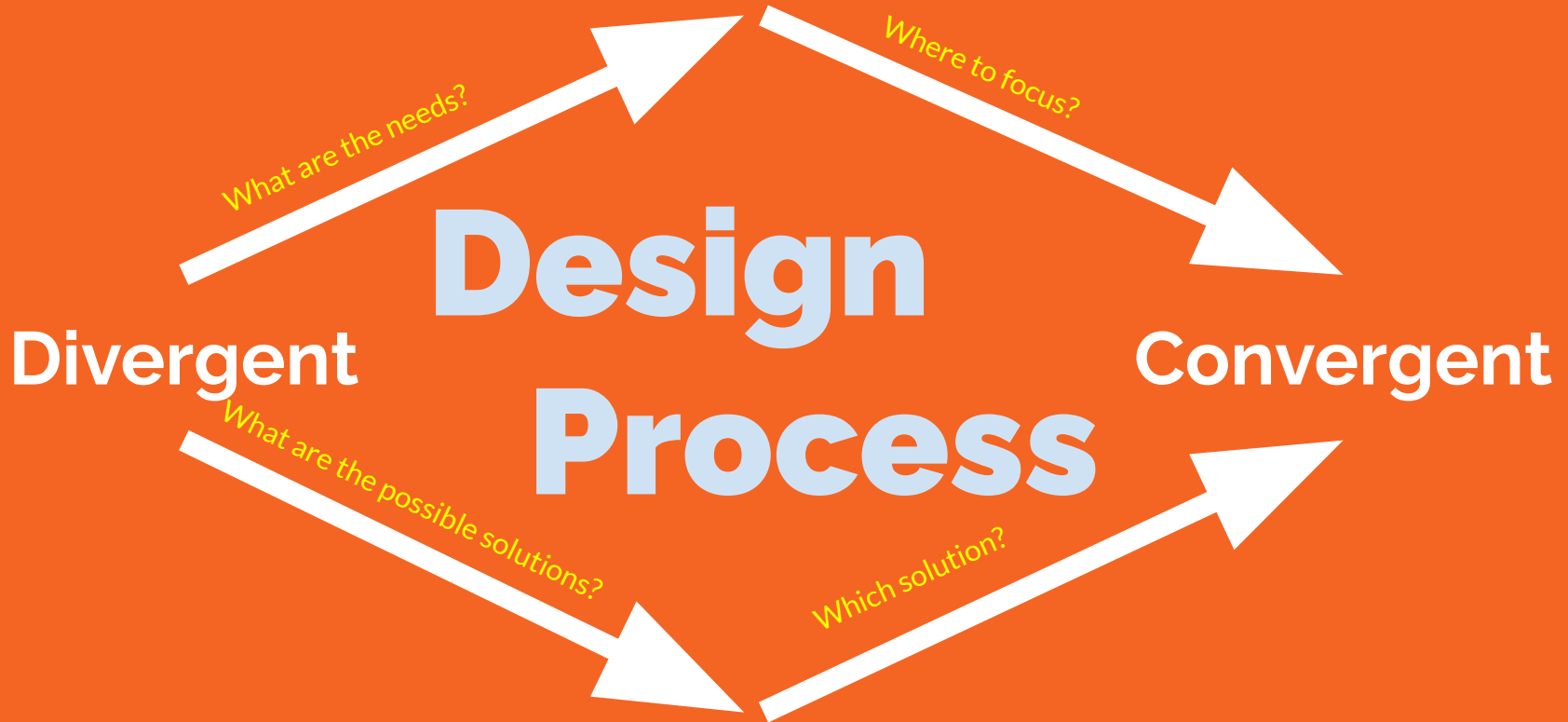
## Questions n' Tests

Blackbox  
Unit  
Alpha and Beta  
SUS  
UEQ

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**In Computer Subjects we  
tend to teach a lot about  
implementation**

**But comparatively little  
about design.**

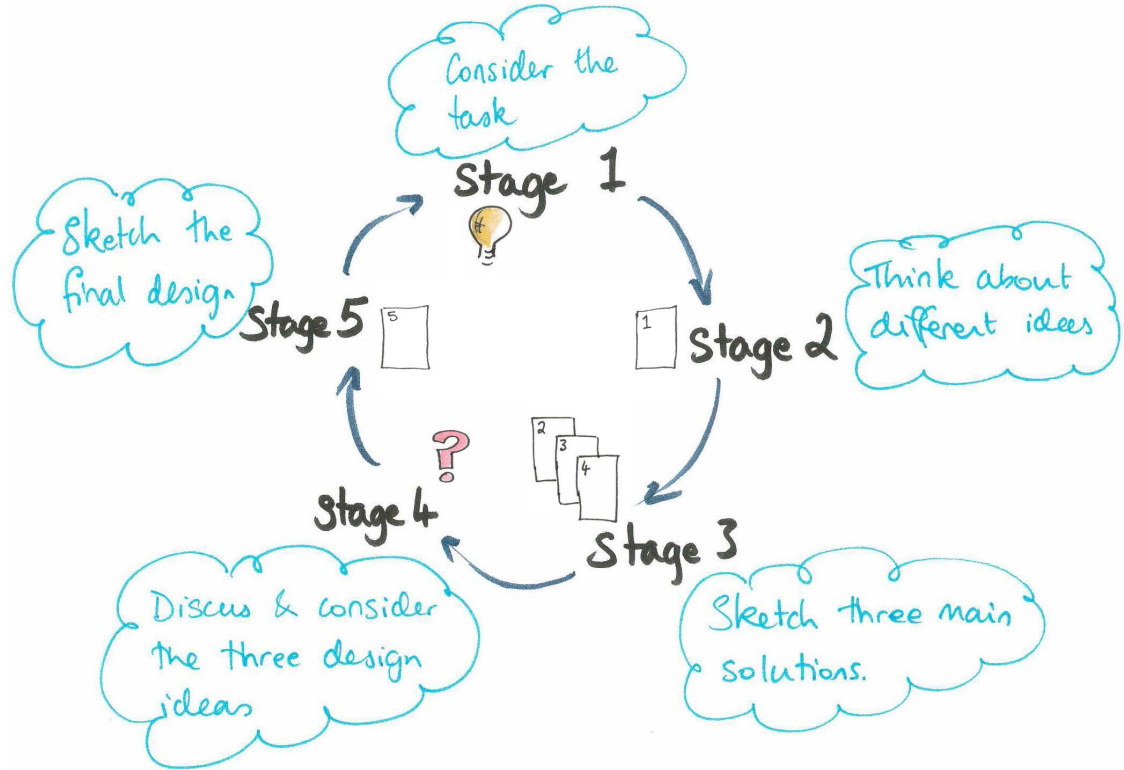
# Creating Applications

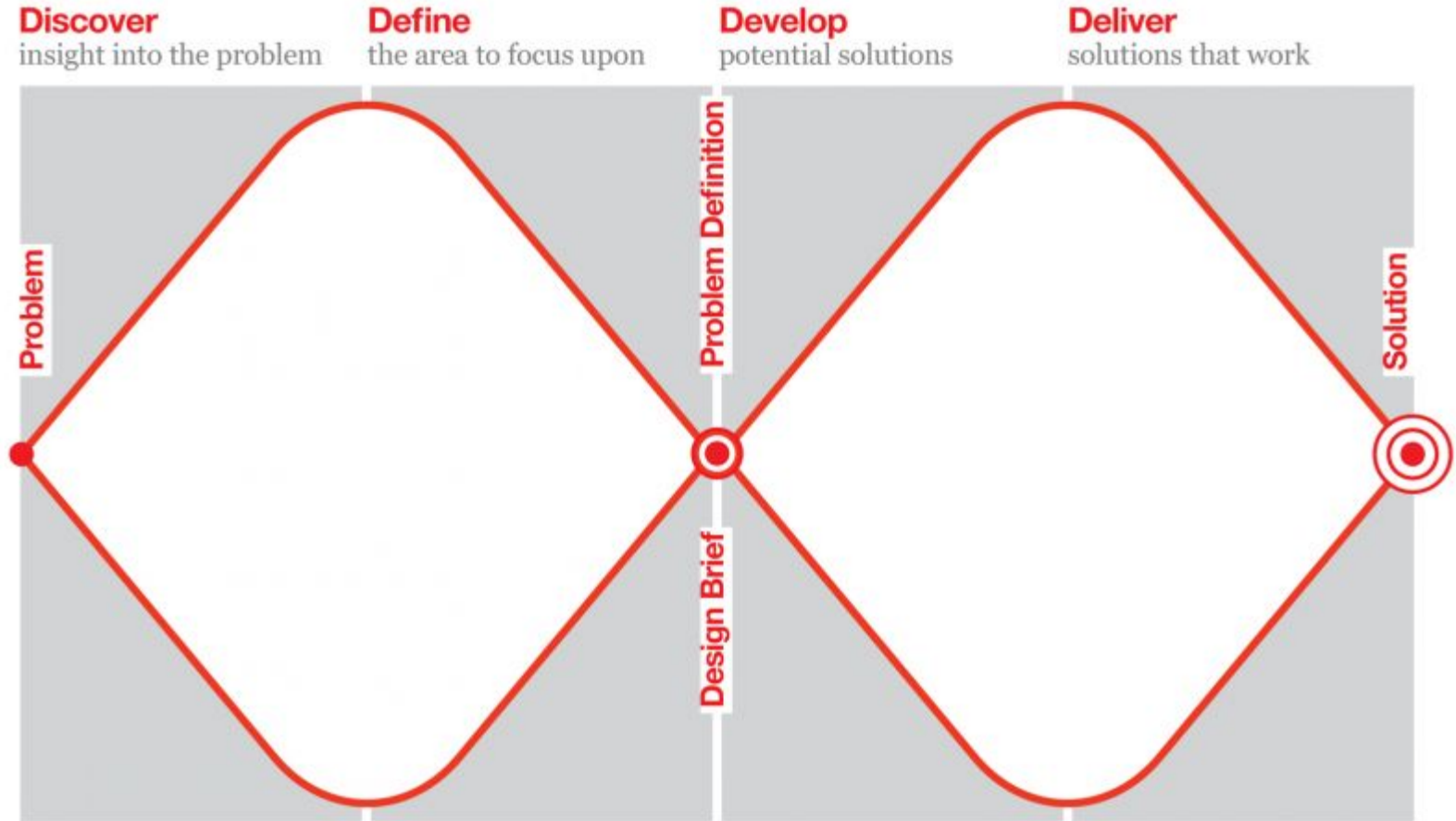


# The Five Design-Sheet Methodology

- Five sheets
- Five parts per sheet
- Five parts to the process

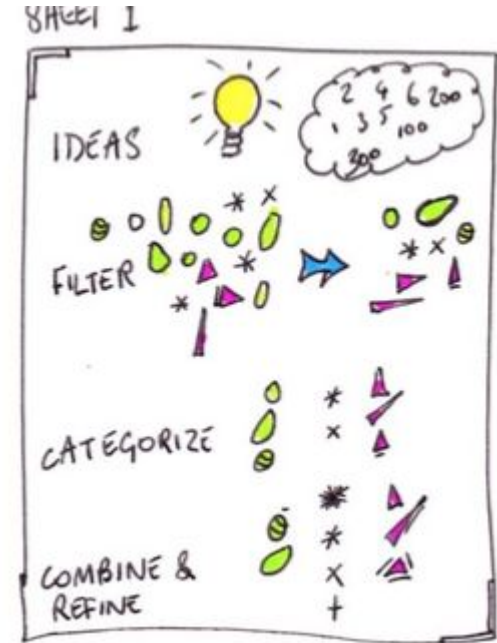
Sheet 1 = Ideas  
Sheets 2,3,4 = Main designs  
Sheet 5 = Realization





# Sheet 1

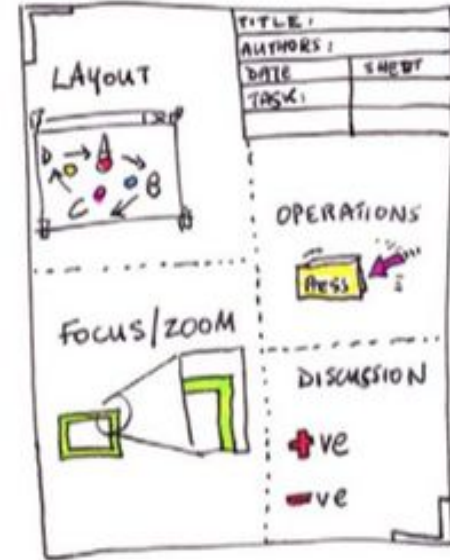
1. **Generate.** Sketch and draw as many ideas as you can think of. In reality these are mini-ideas. They are short concepts that could be part of a whole.
2. **Filter.** Take the ideas and start to remove any duplication. Remove any ideas that seem too similar to another idea.
3. **Categorize.** Start to order and categorize the sketches, the mini-ideas. Concepts that are similar should be located together.
4. **Combine & Refine.** Start to organize the mini-ideas into bigger solutions. Perhaps have multiple views: to be two visualizations that demonstrate different of the same information.
5. **Question.** The final stage is to question what has been generated. Does this provide a solution that the client wants? Does it answer the original research questions?



# Sheet 2, 3, 4

1. **Layout.** This is the vision of what the final visualization would look like. Commonly this would appear as a sketched screen-shot of the typical visualization application.
2. **Focus.** There may be a few key visualization techniques, or in particular, novel visualizations that are being created for this tool. These should be described in the Focus section.
3. **Operations.** Sketches and some brief descriptive how the user operates the visualization, or control user interface should also be included.
4. **Discussion.** A discussion of the advantages and disadvantages of this technique should be included somewhere on the design sheet.
5. **Meta.** Finally meta-information should be included: including title, authors, date, sheet number and task.

SHEET 2, 3, 4

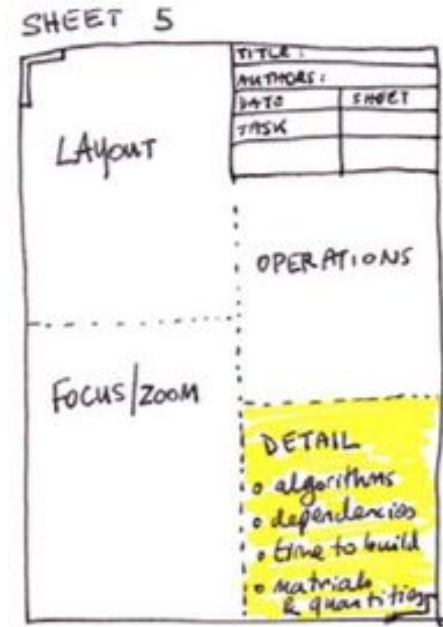




# Sheet 5

This is the realization design. This is what you think (at this stage of development) the visualization tool may look like, what specific visualization technique it principally uses and how users operate it (what functions it provides). The differences with Sheet 5 and sheets 2,3,4 is that the Discussion is exchanged for some Detail.

1. Description of what algorithms are being used (perhaps citations of those algorithms or some critical maths used by the algorithm)
2. Any dependencies. E.g. this could be software libraries that the tool would be built upon, or aspects such as that it must be compatible with a current tool.
3. Estimates of cost or time to build.
4. Specific requirements such as details of any materials and quantities required. E.g. hardware requirements, amount of pixels on a screen.





# IMPORTANT STUFF

→ **Your not an artist...**

... but even if you are, that isn't the point.  
Sketch to explore your ideas, not to  
hang on your fridge.

→ **Don't make work for yourself...**

... don't fall into the trap of sketching,  
and then repeating it all to do a "neat  
version" the best ideas are often messy.

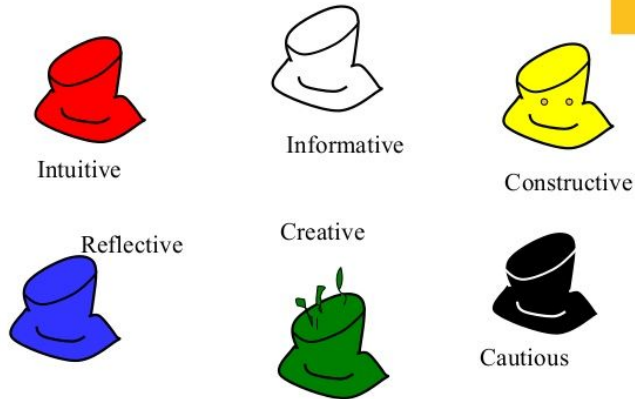
→ **Be divergent...**

Use sheets 1-4 to explore a range of  
ideas. Don't limit yourself to one way of  
thinking.

# 6 Thinking Hats

Edward de Bono

## + Six Thinking Hats



Six Thinking Hats is a system designed by Edward de Bono which describes a tool for group discussion and individual thinking involving six colored hats. "Six Thinking Hats" and the associated idea parallel thinking provide a mean for groups to plan thinking processes in a detailed and cohesive way, and in doing so to think together more effectively.

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# White Hat

Focus on the data available, look for possible gaps and try to fill them. Analyse past trends and try to predict success from historic data.

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# Red Hat

Look at problems using intuition, “going with your gut”, being impulse. Also includes trying to think how others (who do not have your knowledge) may react.

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# Black Hat

Look at all the negative points of a possible decision or solution, be cautious and defensive. Helps make your decision process more resilient by seeing problems in advance.

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# Yellow Hat

Think positively and take an optimistic viewpoint. Try to see the benefits and value in an approach. Helps balance negative exploitation.

# — Green Hat

A “freewheeling” approach to thinking, little criticism with a focus on approaching a problem from alternative directions. Rapid prototyping and trial by error experimentation.



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# Blue Hat

Process control : The chair or leader of a group. Knows when to access the green hat thinkers when ideas are running thin, or the black hat thinkers when contingency plans are required.

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## Use Carefully!

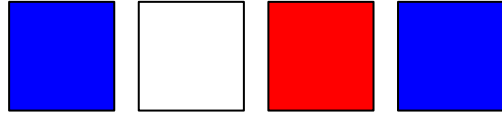
Since the hats do not represent natural modes of thinking, each hat must be used for a limited time only.

Also, some will feel that using the hats is unnatural, uncomfortable or even counterproductive and against their better judgement.

Don't get stuck on one of the hats!



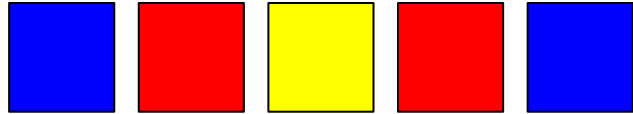
# You don't always need to use all hats



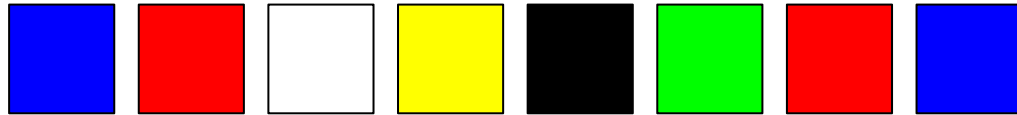
**Brief Review** - Allows for quick delivery of facts followed by emotive reflection.



**Quick Feedback** - Allows facilitators to describe content, review gaps before closing on benefits.



**Brief Content Review** - Allows for quick delivery of facts followed by emotive reflection.



**Comprehensive** - Allows review of the facts, asserting values, justifying action and promoting new ideas while gathering before a

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# Thanks!

## Any questions?

Really into this design stuff? We have a book on the FDS, sketching and other good shizzle!

For more (free) content on the FdS including guides and worksheets

<http://fds.design>

