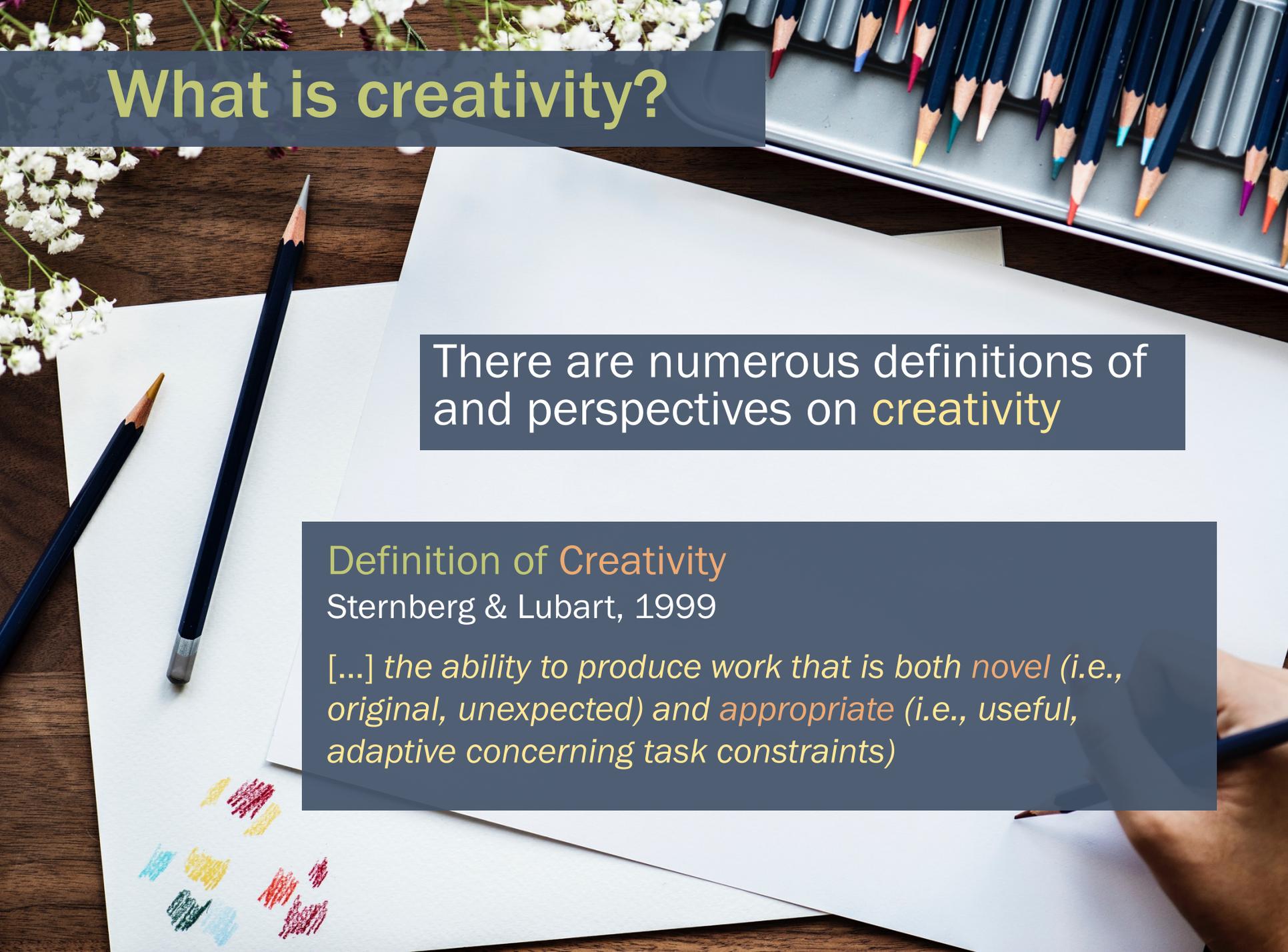


What is creativity?

A top-down view of a wooden desk. In the top left corner, there are small white flowers. A grey tray filled with various colored pencils is in the top right. A hand is visible in the bottom right corner, holding a pencil. The background consists of several sheets of white paper.

There are numerous definitions of and perspectives on **creativity**

Definition of Creativity

Sternberg & Lubart, 1999

[...] *the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)*

Two Cognitive Styles for Creative Thinking

Divergent Thinking

Aim for **quantity!**

Explore choices

Build on others

Play

Imagination

...



Convergent Thinking

Aim for **quality!**

Logic & Reasoning

Judgment

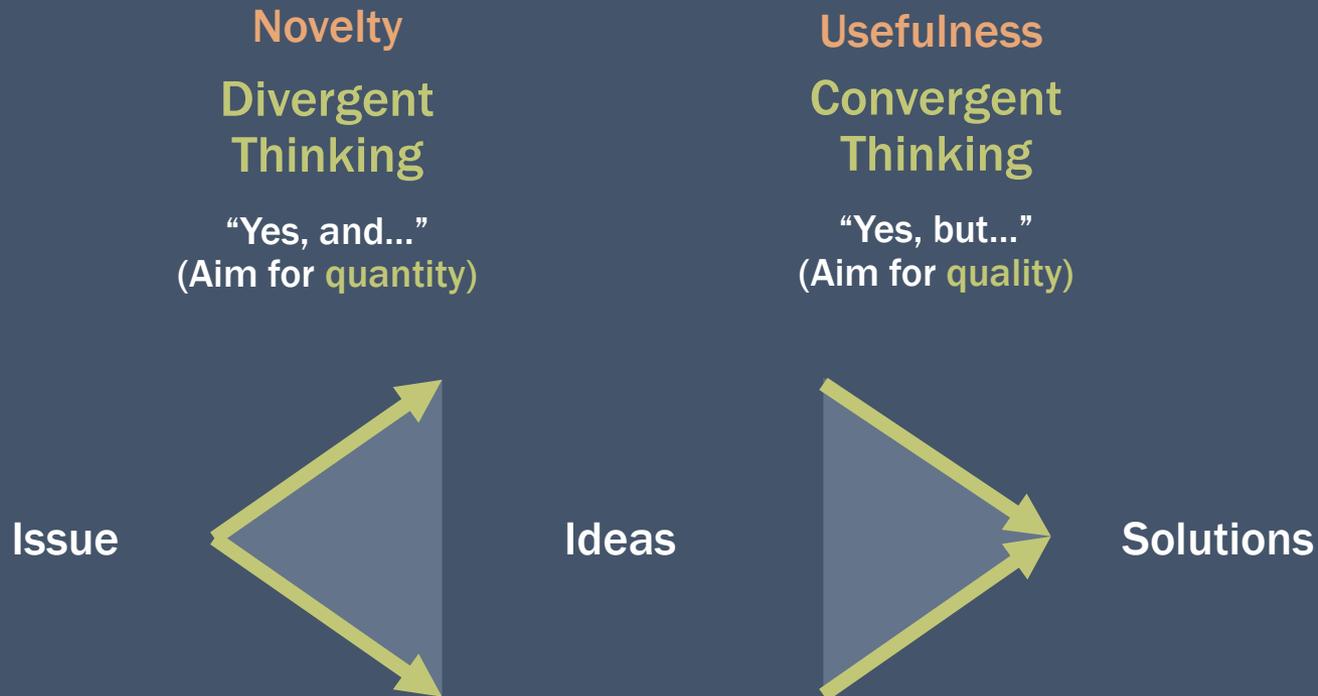
Structuring

Focus

...



The Interplay of Divergent and Convergent Thinking in Creative Thinking



Creative thinking involves both divergent and convergent thinking!

**Frame your
challenge wisely**

$$5 + 5 = ?$$

$$5 + 5 = 10$$

$$? + ? = 10$$

$$2 + 8 = 10$$

$$3 + 7 = 10$$

$$4 + 6 = 10$$

$$5 + 5 = 10$$

$$11 + -1 = 10$$

$$12 + -2 = 10$$

$$13 + -3 = 10$$

Statement Starters

Posing positive, open problem formulations

1. Collect relevant background information (6Ws or 5 Whys)
2. Create many alternative problem formulations that contain the following elements:
 1. Statement Starter
 2. Actor
 3. Action
 4. Goal
3. Statement Starter
 1. How might we... ?
 2. How might...?
 3. What might... ?
 4. What might be all the ways to... ?
4. Choose the most appropriate problem formulation

Statement Starters

Exercise

1. Statement Starter
2. Actor
3. Action
4. Goal

You want to learn German. What might be a concise problem formulation?

- How might I gain more time to learn German?
- What might help me to learn German while I am at work?
- What might be all the ways in which I could learn German in an inexpensive way?

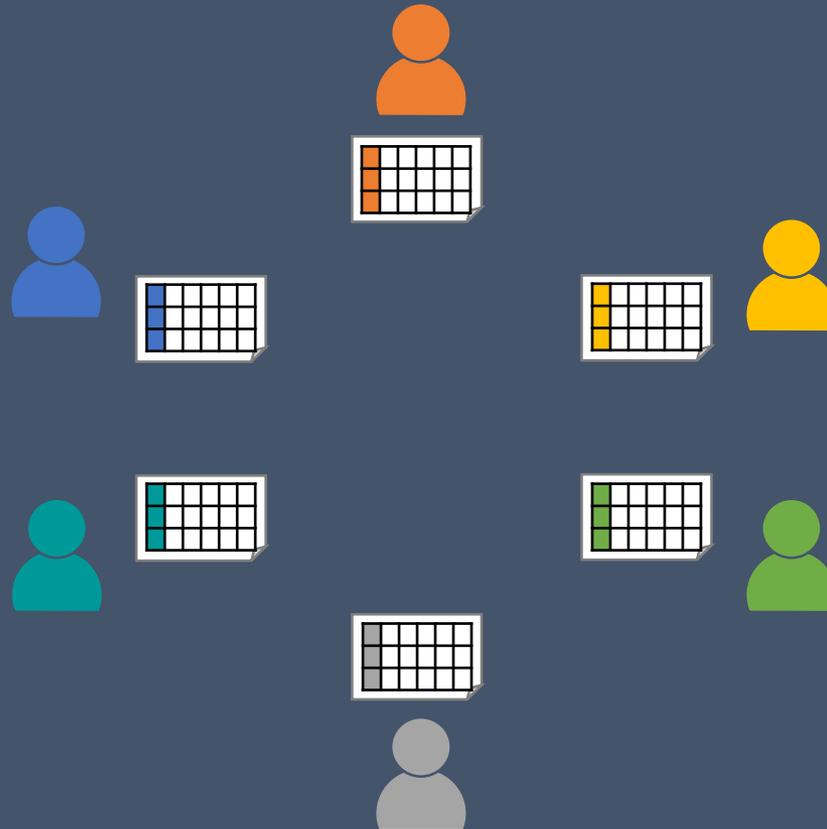
Alternatives to Brainstorming for Divergent Thinking

6-3-5 Method

or any other creativity technique that leverages individual vs. collective phases...

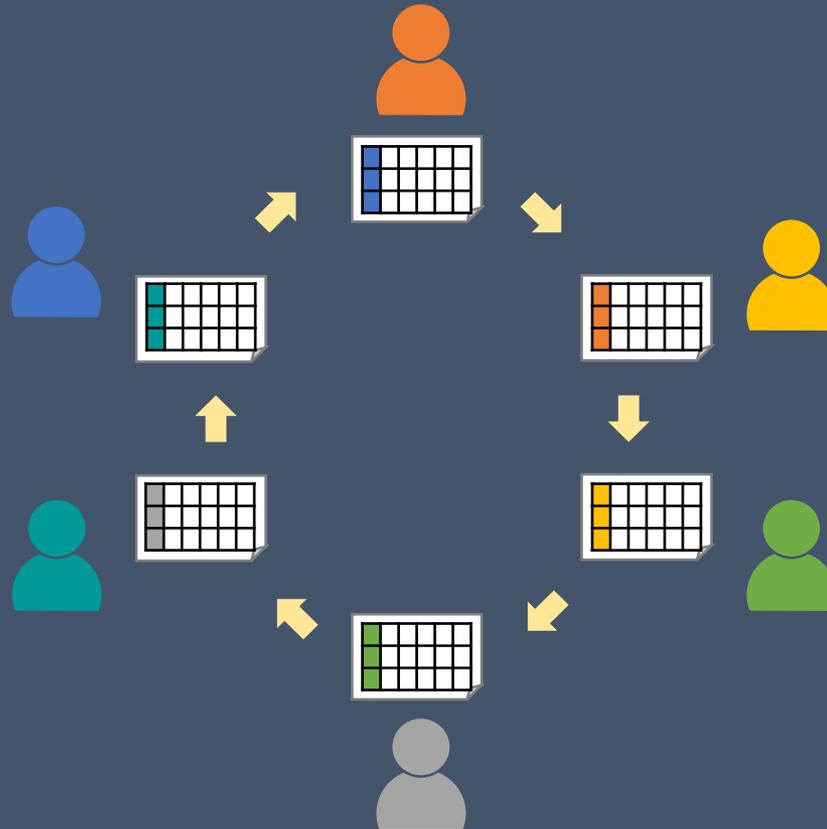
6-3-5 Method Example

How might we increase employee safety?



6-3-5 Method Example

How might we increase employee safety?



Analogies

Transfer solutions from other fields

- **Input**

- A concise but open problem statement (e.g. How might we increase employee safety?)

- **Process**

- The team generates a list of (structurally) similar areas and how the analogous problem is solved in that area
- For each identified analogy, the team generates ideas by mapping solutions in the similar area to the situation at hand

- **Output**

- A list of solution ideas that are analogous to successful approaches in other areas

Analogies

Example

How might we increase employee safety?

| Similar Area | Solution | | Analogous Solution |
|--------------|-------------------------------------|---|---|
| Traffic | Police Traffic lights Airbags | ➔ | Security officer Warning lights Cushion on machines |
| Mountains | Safety ropes Route ratings | ➔ | ... |
| Skiing | Avalanche warnings | ➔ | ... |
| Paragliding | Training Safety parachute | ➔ | ... |
| ... | ... | | ... |

SCAMPER

■ Input

- An initial idea or product or benchmark product/process (e.g. How could a new type of chair look like?)

■ Process

- **S**ubstitute: Which parts could be replaced/substituted?
- **C**ombine: May parts or the whole be combined with other things?
- **A**dapt: How could ideas from other domains be adapted?
- **M**agnify: What could be enlarged or emphasized?
- **P**ut to another use: What are other uses for the idea?
- **E**liminate: What could be reduced or removed?
- **R**earrange/Reverse: How could we rearrange parts or change the order of steps?

■ Output

- A variation of the initial idea

SCAMPER



How could a new type of chair look like?

- **Substitute:** We could replace the chair legs with wires a fixed to the ceiling
- **Combine:** We could attach a coffee cup holder to one one of the armrests or mount a parasol
- **Adapt:** We could build in an electric engine to allow the customer to adjust the backrest as comfortably as possible
- **Magnify:** We could increase the seating surface such that two persons or obese persons could sit on the chair
- **Put (to another use):** We could add hinges such that the customer can turn it into a coffee table
- **Eliminate:** We could remove the armchairs to achieve a minimalistic design.
- **Rearrange/Reverse:** We could attach the chair legs at the middle of each side of the seating surface instead of the corners

Reverse Assumptions

- **Input**

- An initial idea or product or benchmark product/process
(e.g. How could a new type of restaurant look like?)

- **Process**

- Generate a list of assumptions about the idea
- For each assumption, ask what is the reverse of the assumption and list new insights

- **Output**

- Novel and breakthrough ideas

Reverse Assumptions

How could a new type of restaurant look like?

| Assumption | Reverse Assumption |
|---------------------------|--|
| Food is cooked for you | You cook the food |
| Order food from a menu | Order attributes (indulgence, adventure) |
| Sit at a table in a chair | Living room furniture in eating areas |
| Food comes on a plate | Serve food on a Frisbee |
| Go there with a group | Singles dining |

Depending on the number and diversity of your ideas, you might start with **Clustering and Affinity Diagrams** to map the idea space

Procedure

1. Record each idea on a card or note
2. Look for **related ideas**
3. Group them together
4. Go to step 1 until all ideas have been sorted

Affinity Diagram

COCD Box (How-Wow-Now-Matrix)

Not (yet)
feasible

Yellow Ideas

- Future ideas
- Dreams
- Challenges
- Visionary
- Red ideas for tomorrow

HOW?

Feasible

Blue Ideas

- Easy to implement
- Previous examples
- High acceptability
- Low risk
- Quick wins

NOW!

Red Ideas

- Innovative ideas
- Potential Breakthroughs
- Exciting Ideas
- Make a distinction
- Can be implemented

WOW!

Common Ideas

Original Ideas

Participants vote on their favorite ideas using stickers or marks with pens

Procedure

1. Each participant is given a limited number of dot stickers (or pen) (e.g. 3)
2. Each participant silently decides on her/his voting
3. Participants place dot stickers (or their mark) simultaneously next to the ideas they like
4. Ideas with the most dots at the end win

Recommendation

- Restrict the allowed number of dots per idea to prevent individual bias (e.g. 2)

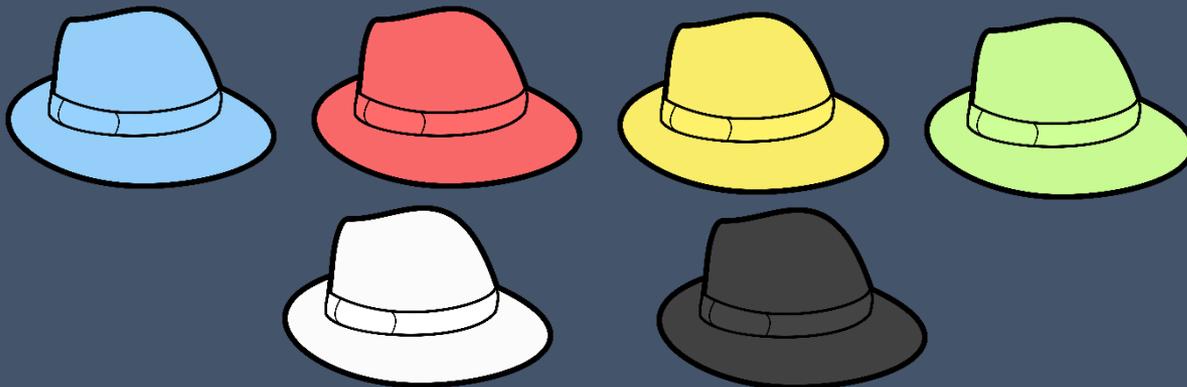
Dotmocracy

6 Thinking Hats

Structured idea refinement for groups

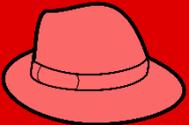
Key idea

- Promote change of perspective among team members
- 6 metaphorical hats represent 6 different thinking styles
- A session is structured in rounds
- Each round prescribes one thinking style
- Thus, each member assumes each thinking style



6 Thinking Hats

Structured idea refinement for groups

| | | |
|---|-------------------|---|
|  | PROCESS | The blue hat is about process control . It is used for thinking about thinking. The blue hat asks for summaries, conclusions, decisions . |
|  | FEELINGS | The red hat is associated with feelings, intuition, and emotion . The red hat allows people to put forward feelings without justification or prejudice. |
|  | BENEFITS | The yellow hat is for a positive view of things . It looks for benefits in a situation. This hat encourages a positive view even in people who are always critical. |
|  | CREATIVITY | The green hat is for creative thinking and generating new ideas . This is your creative thinking cap. |
|  | FACTS | The white hat is about data and information . It is used to record information that is currently available and to identify further information that may be needed. |
|  | CAUTIONS | The black hat relates to caution. It is used for critical judgment. Sometimes it is easy to overuse the black hat. |

6 Thinking Hats

Structured idea refinement for groups

- **Input**

- A meaningful idea description

- **Process**

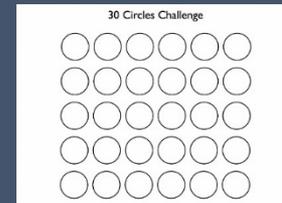
- There are at least six rounds (each hat should be assumed at least once)
- The group discusses the idea from the perspective of the current hat
- A facilitator makes sure that everyone sticks to the current hat

- **Output**

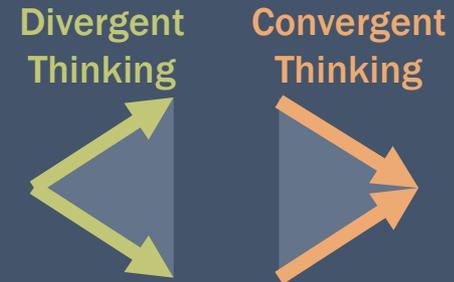
- A refined idea concept and solution draft

Key Takeaways for Ideation

- Lesson 1
Creativity is about challenging assumptions, habits and rules to generate **novel and useful** ideas!



- Lesson 2
Ideation involves two complementary modes of thinking: **divergent and convergent thinking**.



- Lesson 3
In group ideation, **nominal groups outperform interactive groups**.

