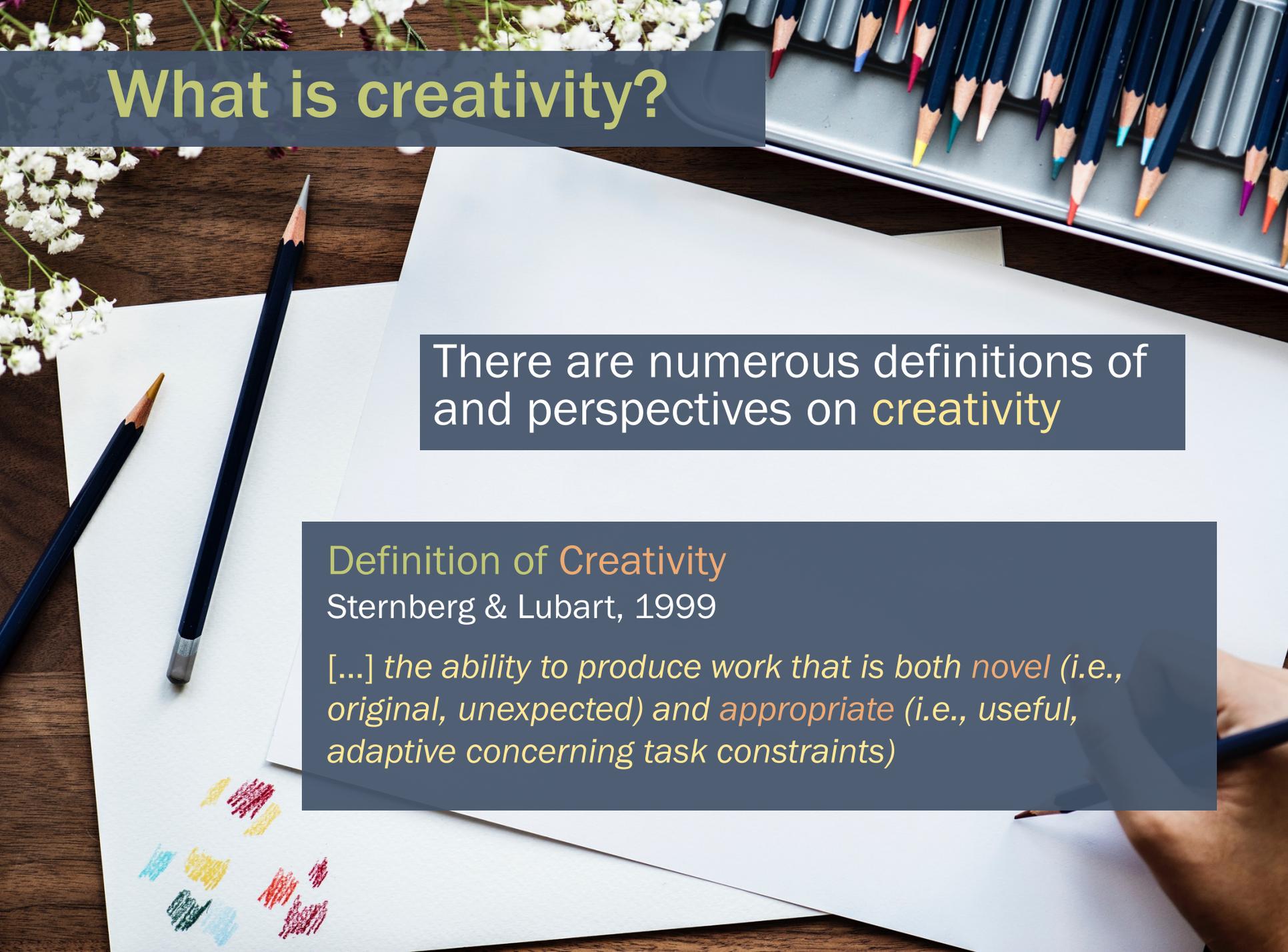


What is creativity?

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. In the bottom left, there are several colorful pencil smudges on a white sheet of paper. The background is a dark wood surface.

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

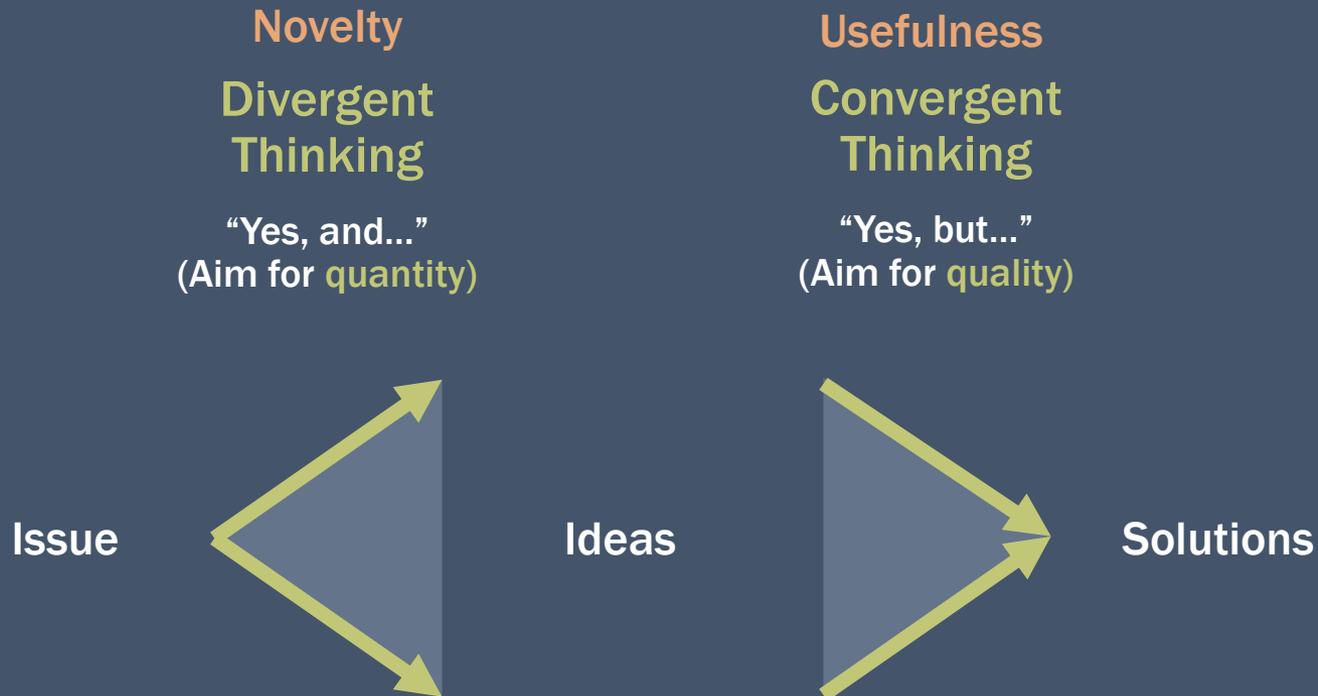
Structuring

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?

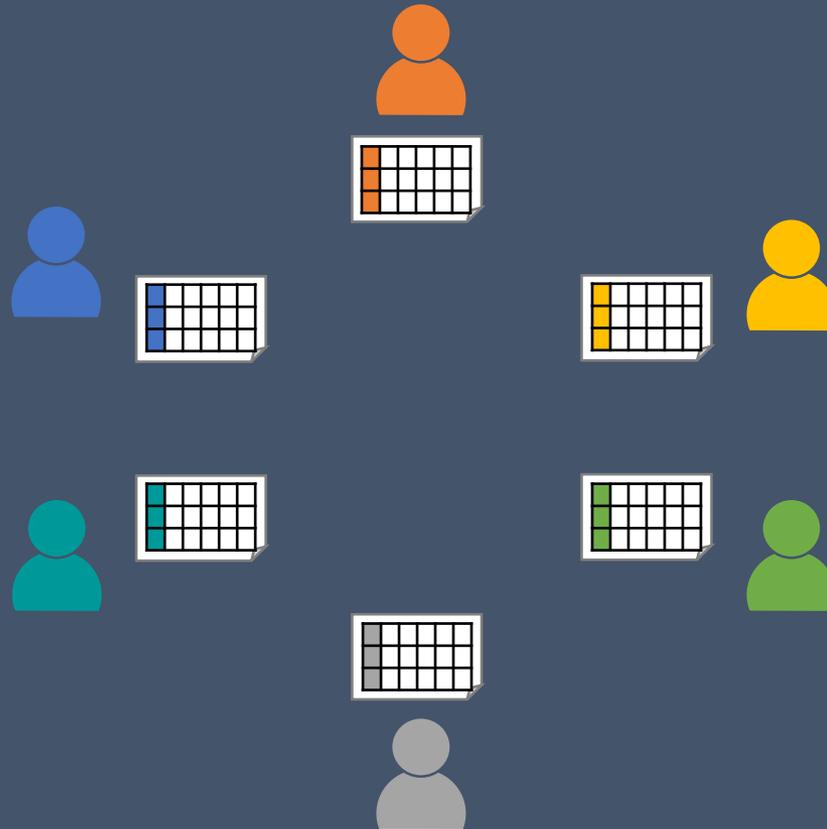
Alternatives to Brainstorming for Divergent Thinking

6-3-5 Method

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

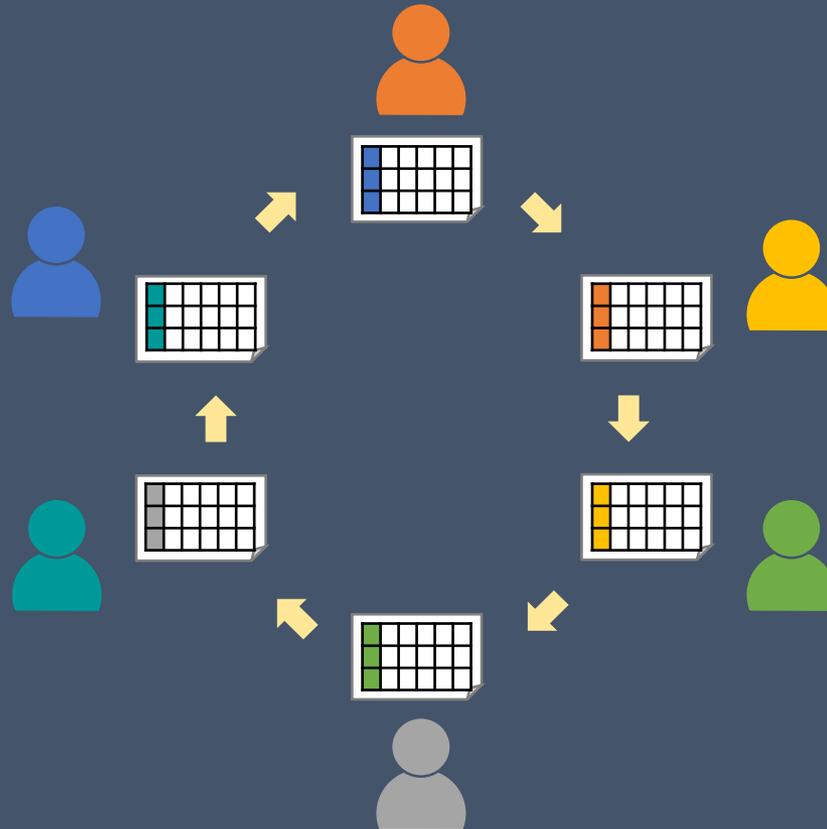
6-3-5 Method Example

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)

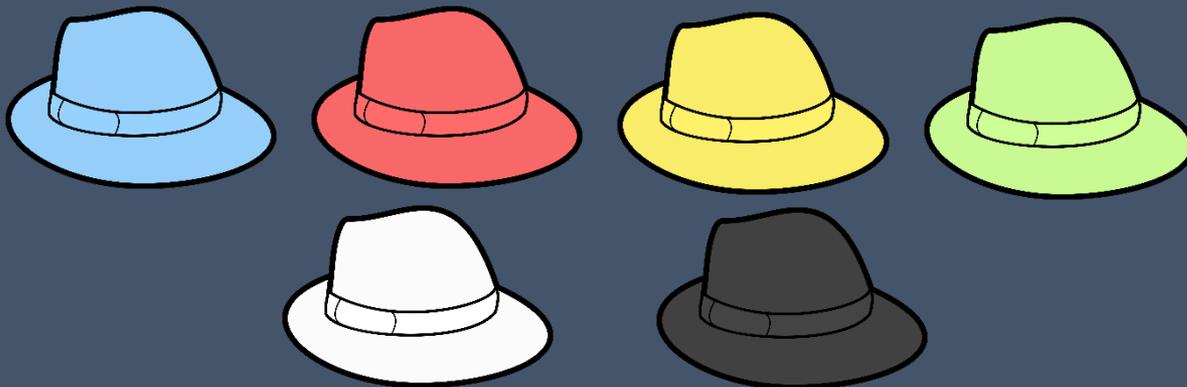
Dotmocracy

6 Thinking Hats

Structured idea refinement for groups

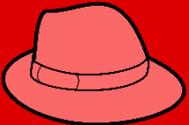
Key idea

- 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**

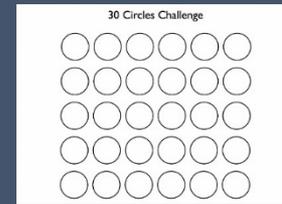
- There are at least six rounds (each hat should be assumed at least once)
- The group discusses the idea from the perspective of the current hat
- A facilitator makes sure that everyone sticks to the current hat

- **Output**

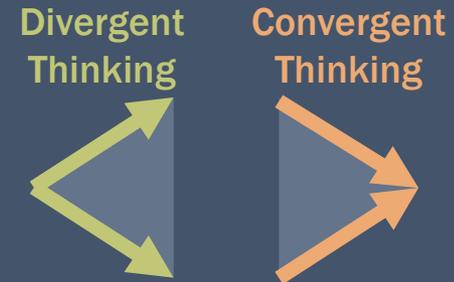
- A refined idea concept and solution draft

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**.

