

# Zitate

- “Have no fear of perfection, you’ll never reach it” – Salvador Dali
- “If you hear a voice within you say, ‘You cannot paint,’ then by all means paint, and that voice will be silenced” – Vincent Van Gogh
- “Curiosity about life in all of its aspects, I think, is still the secret of great creative people” – Leo Burnett
- “Creativity is more than just being different. Anybody can plan weird; that’s easy. What’s hard is to be as simple as Bach. Making the simple, awesomely simple, that’s creativity” – Charles Mingus
- “Originality is nothing but judicious imitation” – Voltaire
- “Creativity is contagious, pass it on” – Albert Einstein
- *If I had an hour to solve a problem I’d spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.*
  - - Albert Einstein -

Concept Development Course

# Ideation

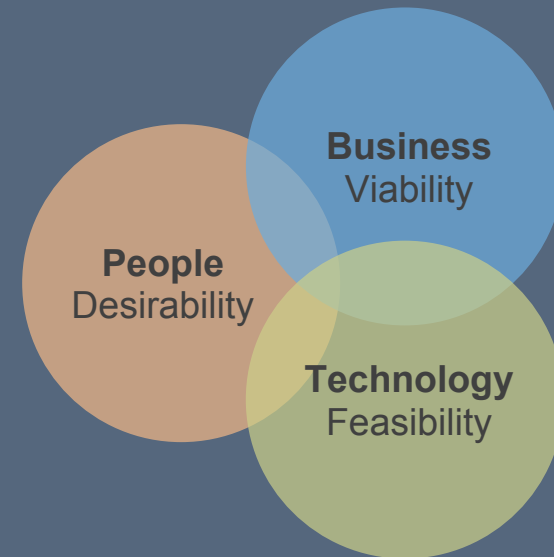
Marin Zec, TU München

Veronika Gamper, CDTM

# A few words about me

## Marin Zec

- A huge fan of **Human Centered Design Thinking**
- Educational Background  
**Computer Science** (LMU, TUM, University of Augsburg, MIT),  
**Economics** (TUM, FUH)  
& **Philosophy** (LMU)
- **PhD student** & Research Assistant  
at TUM in the area of **Knowledge Work and Collaborative Creative Complex Problem Solving**
- **Freelance Consultant & Engineer**  
Goethe Institut, Volkswagen, ProSiebenSat.1, MIT, Siemens, ForceFive,  
Waldburg-Zeil Kliniken and more than 30 SME and startups



# Course Overview

## User Research, Data Analysis

Week 1

Today

**Today: Generate & Refine Solution Ideas based on your User Research and Transform them into Stories**

### 1. Creativity & Creativity Research

### 2. Creativity Techniques

- Divergent Thinking  
6-3-5- Method, Analogies and Morphological Analysis
- Convergent Thinking  
SCAMPER, Dotmocracy

### 3. Storyboarding

- Storytelling
- Storyboards

Week 2

Mid Presentation, Prototyping, Final Presentation

# Agenda

09:15 – 10:00	Introduction	Lecture Hall
10:00 – 10:30	<b>Divergent Thinking</b>	Lecture Hall
10:30 – 12:00	6-3-5 method, Analogies	Breakout Rooms
12:00 – 12:45	Lunch Break	
12:45 – 13:15	<b>Convergent Thinking</b>	Lecture Hall
13:15 – 14:15	Dotmocracy, Idea Refinement	Breakout Rooms
14:15 – 14:30	Short Break	
14:30 – 15:00	<b>Morphological Analysis &amp; Storyboarding</b>	Lecture Hall
15:00 – 16:00	Storyboard Ideation	Breakout Rooms
16:00 – 16:45	Storyboard Design	Breakout Rooms
16:45 – 17:00	Summary & Closing	Lecture Hall

# 1

## **Cold Start**

A 10 minute crash course on creativity techniques

Take a pen and paper. You have 50 seconds.



50s

# Let's agree on some ground rules

Aim for **Quantity**

Search for **wild ideas**

**Combine with and improve on** existing ideas

**Defer judgment**



Take a pen and paper. You have 50 seconds.

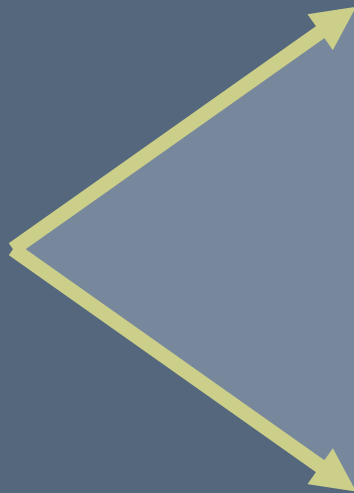


50s

# Key Insight from Creativity Research

## Divergent Thinking

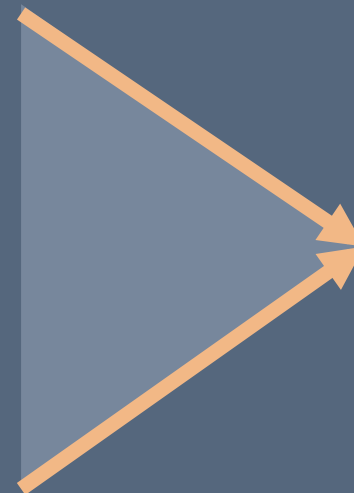
Issue



Aim for **quantity!**

## Convergent Thinking

Solution  
Idea



Aim for **quality!**

# Ground Rules



## Divergent Thinking

Aim for **quantity**!

Defer judgment

Search for **wild ideas**

Combine with and improve on existing ideas

## Convergent Thinking



Aim for **quality**!

Think **positive** (potentials rather than problems)

Act **consciously and thoroughly**

Keep the **goal** in mind

Aim to **improve ideas** (ideas are not solutions)

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## Examples of Creativity

# Age verification

## Age Verification

This Website requires you to be 15 years or older to enter. Please enter your Date of Birth in the fields below in order to continue:

January ▼	01	1989	Submit
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# Separate faucets (UK)



# Separating egg whites



# 3

## **Creativity and Technique**

This course is about creativity techniques.  
But wait. Isn't this a paradox?



# What is Creativity?

*figure 1*

There are various definitions and notions around the concept of *creativity* or *creative*

*figure 2*

## 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)*

*figure 3*  
noun creativity  
krē-(i)ā-'ti-və-tē, |krē-ə\

*figure 4*

# What is a Technique?

- A **technique** is a way of doing something by using special knowledge or skill.

## Definition of Technique

*noun* tech-nique \tek-<sup>h</sup>nēk\

Merriam-Webster

[...]

- 2    **a** : a body of technical methods (as in a craft or in scientific research)  
      **b** : a method of accomplishing a desired aim

## But how do they fit together?

- On the one hand, striving for **creativity** we are looking for **novel** and appropriate **ideas** and solutions
- On the other hand, **techniques** are basically **stable and predetermine** how certain things are supposed to be done

# Creativity Techniques

- We have to avoid a **common misconception** about the aim of creativity techniques:

*“Creativity techniques are a foolproof way to systematically produce creative output”*

- **No!** Creativity techniques **do not** “produce” creative results. People do! Creativity techniques **cannot enforce creative output.**
- Rather, creativity techniques **aim to decrease mental block** and promote an open environment that **fosters divergent thinking** such that creative thoughts are more likely to surface

# 4

## **Creativity in Groups**

Groups are more creative, right?

# Group Creativity

A top-down view of a wooden table. Several hands are visible, interacting with various objects: wooden blocks, puzzle pieces, and a piece of paper with a lightbulb drawing. The background is a rustic wooden surface.

Sometimes teamwork is **indispensable**, e.g. in team sports such as Volleyball

At other times, teamwork is not mandatory, but **we expect that a group performs** better than individuals, e.g. in Brainstorming

**Are we correct?**

# Everyone knows Brainstorming(?)

*“A bunch of people gather together to generate a list of spontaneous ideas around a certain issue”*

- Originally proposed by Alex Osborn in 1939
- Probably the **most popular and most misused** creativity technique
- In practice, there is a broad range of variations. Thus, brainstorming is actually a **class of more or less similar creativity techniques.**

# Osborn's Brainstorming

(Isaksen et al, 1998)

- Brainstorming is a creative conference for creating a **checklist of ideas** which can be **subsequently evaluated and further processed**
  
- Group session was designed to **supplant individual ideation**
  
- 4 basic guidelines
  1. Criticism is ruled out
  2. Freewheeling is welcomed
  3. Quantity is wanted
  4. Combination and improvement are sought
  
- Osborn recommended a **trained facilitator** and **recorder**
  
- **5-10 participants** selected based on the nature of the problem



# Brainstorming Research

## Key claim of Osborn

*Brainstorming in a group leads to the generation of more and better ideas than would be obtained individually*

Is this true?

# Brainstorming Research

## What is the correct comparison condition?

### 1. Interacting Group vs. Individual

- ✓ An interacting group, on average, generates more and better ideas than an individual



### 2. Interacting Group vs. Non-interacting Group

- An interacting group, on average, generates more and better ideas than a non-interacting group?



#### Real Group

Group members work on the same task and interact with each other

#### Nominal Group

Group members work on the same task but do not interact with each other

# Results

(see Mullen, Johnson & Salas, 1991)

- In all experiments, **interacting groups hardly ever produced as many ideas as non-interacting groups**. In fact, in most cases they generated significantly less ideas.
- The deficit is **not compensated by increased quality**. On average, interactive groups did not create more creative or more practicable ideas than non-interacting groups.
- Countermeasure  
**Brainwriting instead of Brainstorming**

# Why do real groups sometimes perform worse than nominal groups?

- Framing
- Production Blocking (e.g. Diehl and Stroebe 1987)
- Groups often prefer (even incorrect) solutions proposed by the majority (e.g. Torrance 1954; Smith, Tindale & Steiner 1998)
- Social Loafing (e.g. Latané et al. 1979)
- Dispensability effect (e.g. Kerr & Bruun 1983)
- Sucker effect (e.g. Kerr 1983)

...

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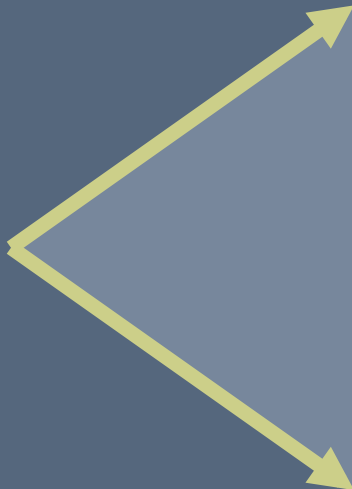
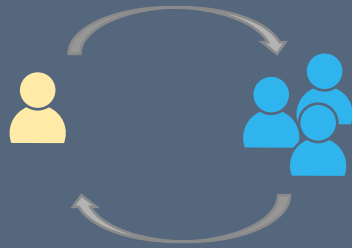
## Summary

# Summary

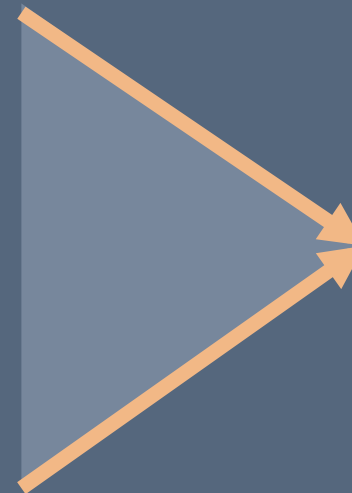
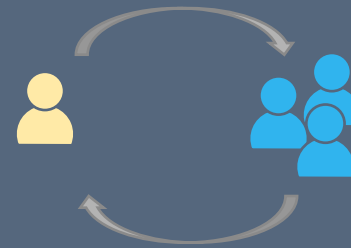
- Ideation involves two complementary modes of thinking: **divergent and convergent thinking**
- Creativity techniques aim to **decrease mental block and foster divergent thinking**
- A large body of research has shown that **groups do not necessarily perform better in creative problem solving tasks**

# Key Takeaway

## Divergent Thinking



## Convergent Thinking



**Next steps**

**6-3-5 Method & Analogies**



# 6-3-5 Method

## Structured brainwriting for groups

- **Input**

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

- **Process**

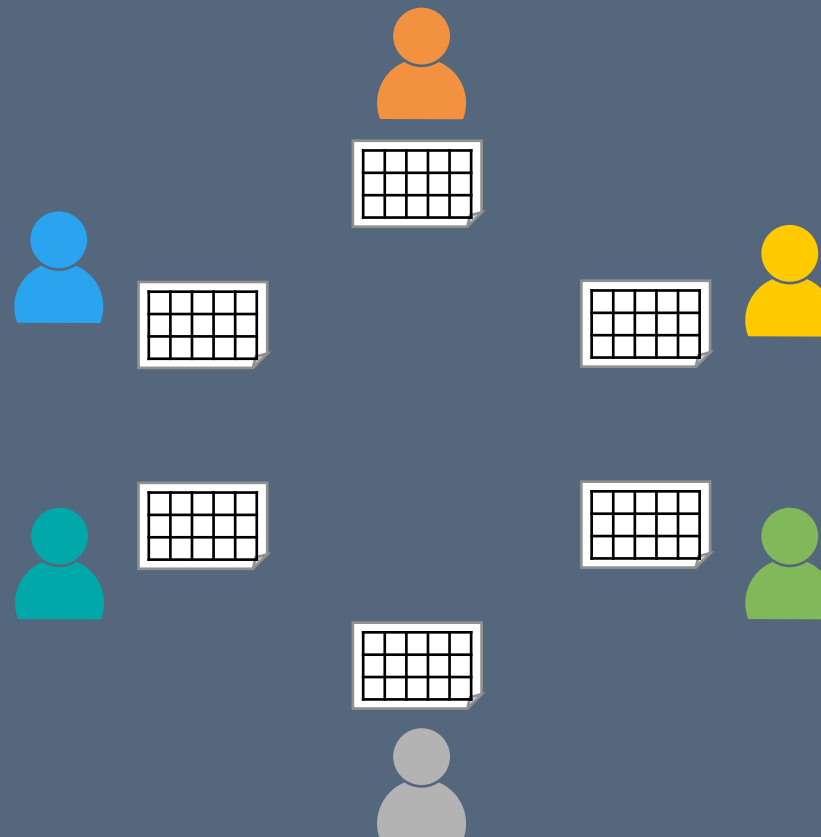
- Each team member is handed out an empty 6-3-5 template
- One run consists of **6 rounds** (# rounds = # participants)
  - In each round of **5 minutes** duration, every team member **silently** generates **3 ideas** and **writes them down in the specified area on his/her worksheet**. Team members should build on the ideas of others but can also decide to ignore them.
  - After each round, team members **pass on their worksheet** to the team member at their right.
- Conduct another run if desired

- **Output**

- Up to **108 ideas in 30 minutes**

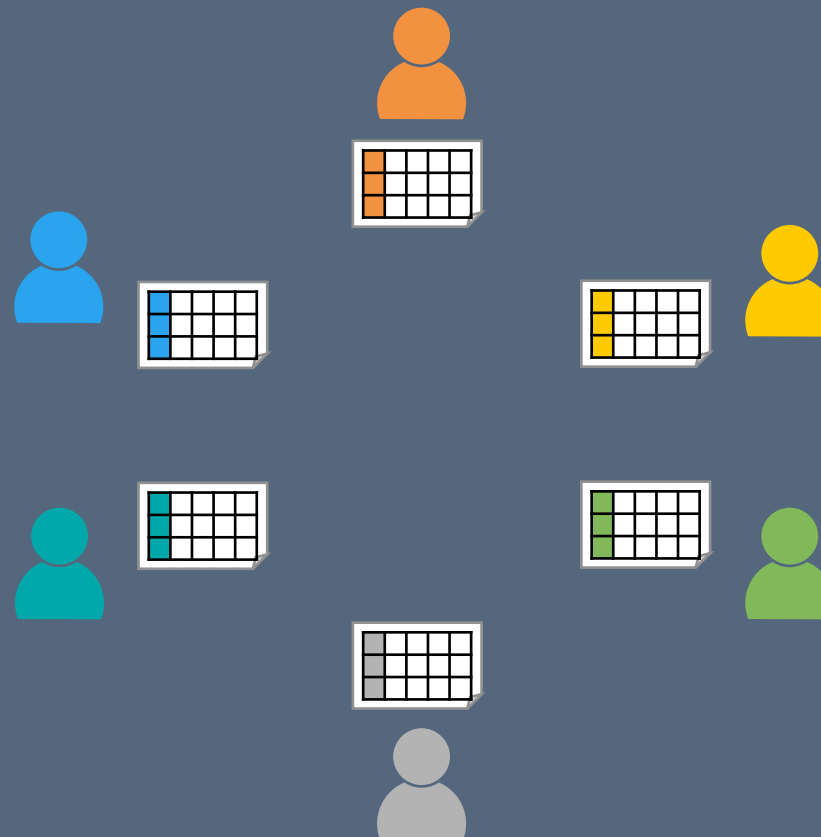
# 6-3-5 Method Example

How might we increase employee safety?



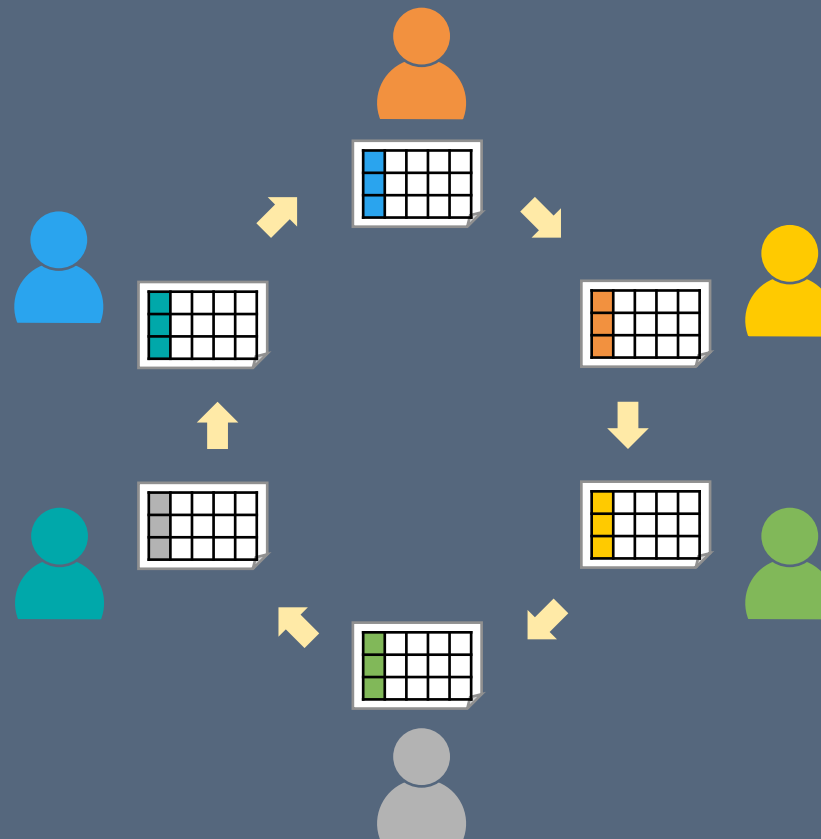
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How might we increase employee safety?



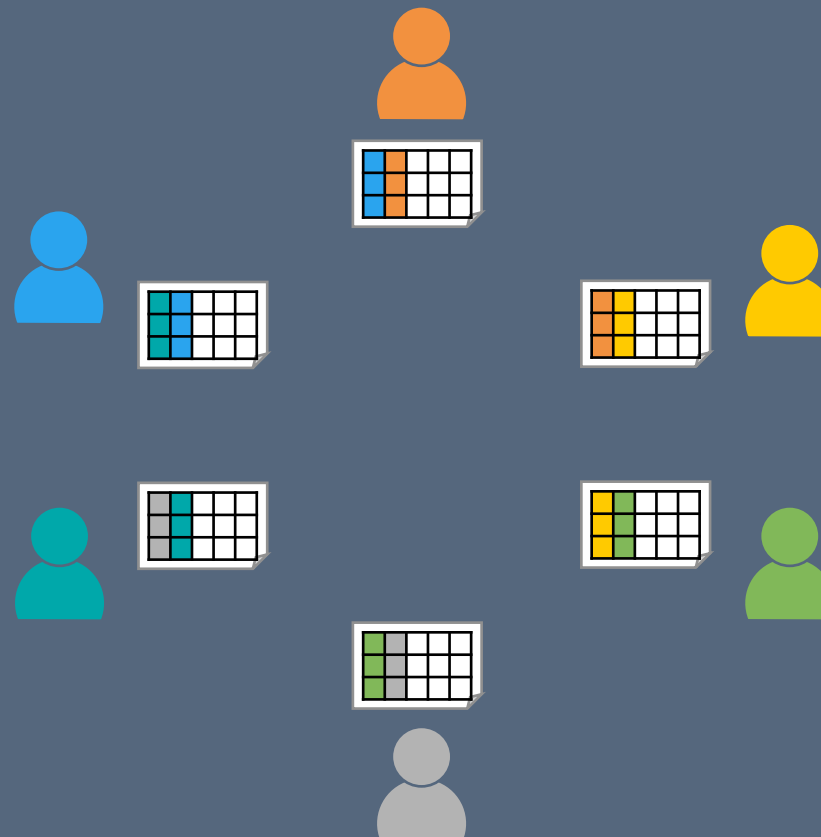
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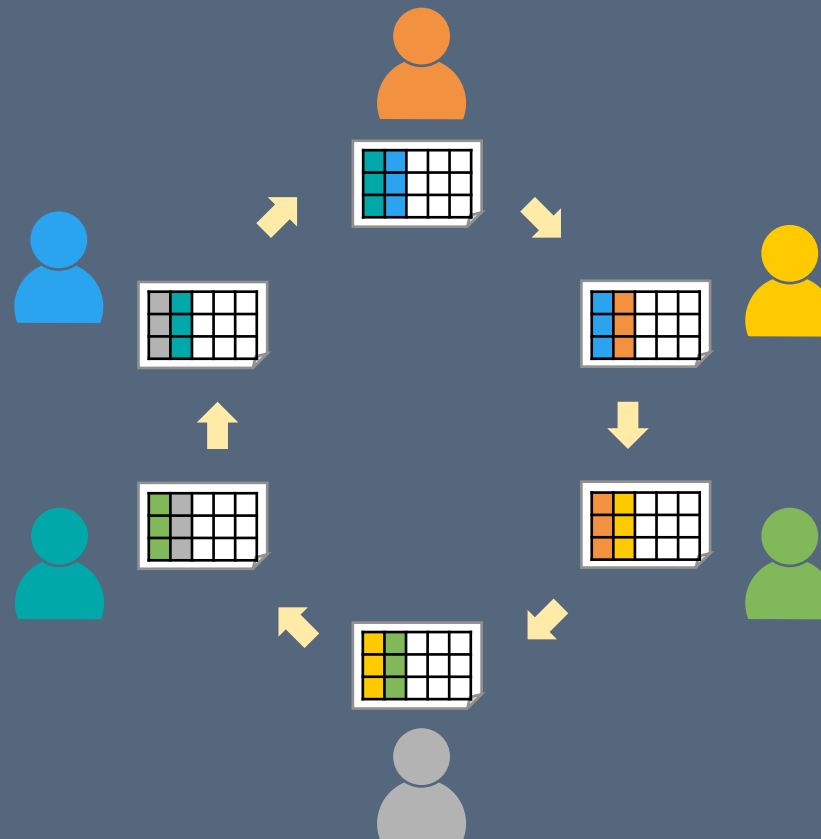
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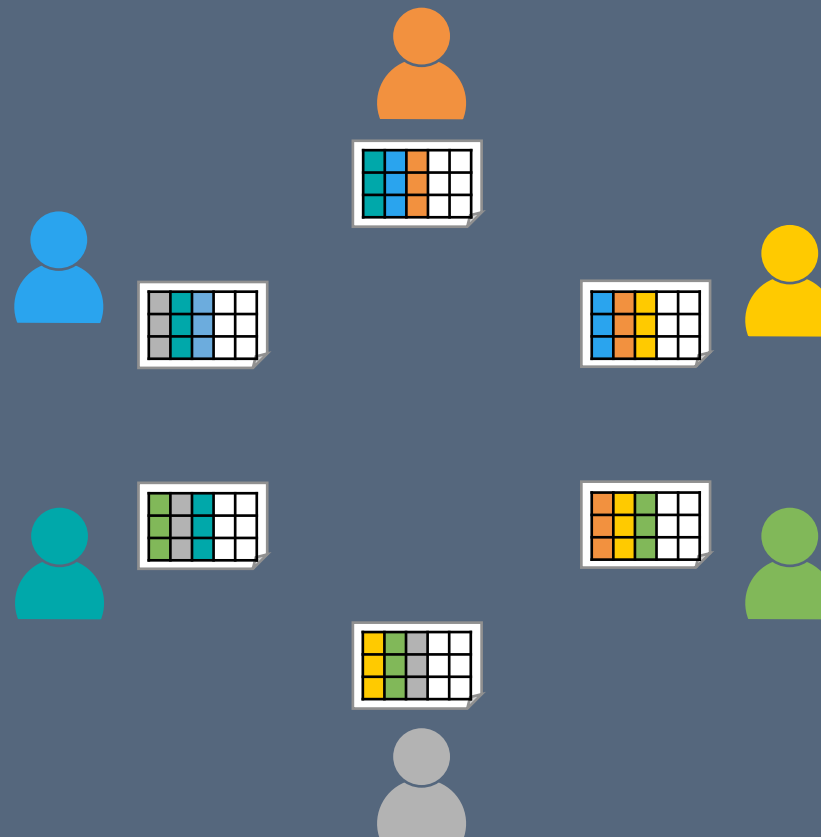
# 6-3-5 Method Example

How might we increase employee safety?



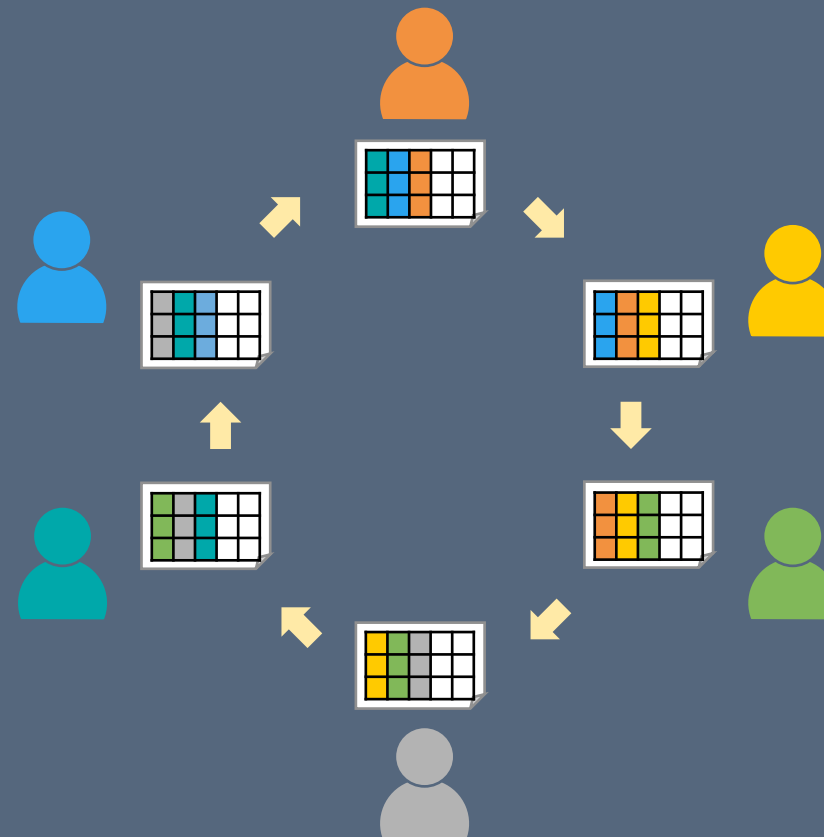
# 6-3-5 Method Example

How might we increase employee safety?



# 6-3-5 Method Example

How might we increase employee safety?



and so forth...



# 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	→	...
...	...		...