What is creativity?

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

*not so much at this...*

*We are pretty good at this!*
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
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?**

<table>
<thead>
<tr>
<th>Similar Area</th>
<th>Solution</th>
<th>Analogous Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic</td>
<td>Police, Traffic lights, Airbags</td>
<td>Security officer, Warning lights, Cushion on machines</td>
</tr>
<tr>
<td>Mountains</td>
<td>Safety ropes, Route ratings</td>
<td>...</td>
</tr>
<tr>
<td>Skiing</td>
<td>Avalanche warnings</td>
<td>...</td>
</tr>
<tr>
<td>Paragliding</td>
<td>Training, Safety parachute</td>
<td>...</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
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 agonify**: 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 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?

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

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