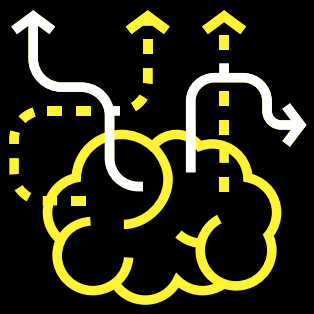
Practical exercises



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Introduction to practical exercises

To support active learning, each theme includes a number of exercises of varying duration and complexity. The exercises have been chosen to illustrate important concepts, tools and insights within each theme. The duration of the exercises ranges from about five minutes to one hour, and they involve a variety of materials and resources.

All of these practical exercises are described in detail under each theme based on the following: Subject type, Theme, Participants (amount of), Duration, Materials, Description, Questions for reflection after the exercise, and Other examples that can be used in the exercise.

On the next page an overview of all 28 exercises is presented together with information about exercise nummer, title of the exercise, which theme the exercise is related to (1: Ideation, 2: Sources of Inspiration, and 3: Constraints), duration of the exercise, and the number of participants (individual, pairs, groups) that is best suited for the exercise.

NR	TITLE	THEME	DURATION	PARTICIPANTS
1	Getting in line with no words	1	5-10 min	
2	Analytical ideation with constraints	3	30-60 min	
3	Bad ideas	1 · 3	30-60 min	
4	Constraints in your own practice	3	30-60 min	
5	Build an object inspired by a different domain	1 · 2 · 3	30-90 min	
6	Design for the future	2 · 3	20-60 min	
7	Circulating inspiration group work	1 · 2	40-60 min	
8	Design for a fictional world	2 · 3	20-60 min	
9	The six thinking hats	1 · 3	5-30 min	
10	Different small tasks about constraints	3	5-15 min	
11	Exstreme characters	1 · 2	30-60 min	
12	Find inspiration in the design material	2	5-15 min	
13	Too many options	3	15-20 min	
14	Too few options	3	15-20 min	
15	Recycling design materials	2 · 3	20-60 min	
16	Reinvent the wheel	1 · 2	15-30 min	
17	What if?	2	30-40 min	
18	What were they thinking about?	1	5-15 min	
19	Know your user	1 · 2	60-120 min	
20	Sources of inspiration in your own practice	2	30-60 min	
21	Combinational creativity	1 · 2 · 3	30-60 min	
22	Mapping out the domain for inspiration	2	30-60 min	
23	LEGO duck challenge	2· 3	15 min	
24	Marshmallow challenge	1 · 3	20-30 min	
25	Framing a project via inspiration search	2	20-40 min	
26	Back to back	3	5-10 min	
27	Write a poem	3	10-15 min	
28	Simple and short tasks about creative constraints	3	5-15 min	
29	Simple and short tasks about inspiration	2	5-30 min	

1 *Getting in line with no words*

SUBJECT TYPE	**All subjects**
THEME	**1 Ideation, 3 Constraints**
PARTICIPANTS	**The whole class**
DURATION	**5-10 minutes**
MATERIALS	**Timer/stopwatch**

Purpose
An introductory and entertaining warm-up exercise, which can be used to introduce the students to the best way to organise a process. The teacher will typically find that the students immediately (out of habit) choose to meet the challenge with a form of sign language, which is not the most effective or original solution.

Description
The students are asked to get up, and there must be space for them all to stand up in the room and move around each other. The students now have to place themselves as quickly as possible in chronological order of age (day-month-year, e.g. 21 October 1992), from the oldest on the left to the youngest on the right.

The students are instructed that they are not allowed to talk or write messages on mobile phones, notes, the board, etc., but can only communicate silently and without any writing aids. They therefore have to find a solution for themselves. The teacher kicks off the exercise and starts a stopwatch. If a student stands in the wrong place in the chronological sequence, the teacher can say (jokingly) that such mistakes cost a small time penalty, e.g. 10 seconds.

When the students think they are standing where they should, the teacher checks the order by having the oldest student (at the far left) state his or her full date of birth, then the second oldest, and so on. Errors are noted down.

The teacher then notes the total time, and perhaps also the average time per student, so the class can have a friendly competition with parallel classes.

Questions for reflection after the exercise
Why did you use sign language? How did you agree that this was the best solution? Was it difficult/easy? What methods did you use to organise yourselves? What else could you have done? (The fastest way to complete the exercise would definitely have been for them each to show their yellow health insurance certificate or other ID card with their date of birth, such as a driving licence).

Other examples to use in the exercise
Shoe sizes, hair colours, house numbers, initial letter.

2 *Analytical ideation with constraints*

SUBJECT TYPE	**All subjects**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-60 minutes**
MATERIALS	**PC or pen and paper**

Purpose
To be able to identify key elements and constraints in other creative concepts and products, and use these elements in a constructive and structured way as a resource for ideation in your own creative practice.

Description
The students are told that the aim of the exercise is for them to produce a new creative concept inspired by an existing success. The students are asked to create a table with two columns with at least ten rows each. They then jointly choose an example, depending on current topics in their course, e.g. a TV series, as the object for analysis. Alternatively, the teacher may have chosen this in advance. The students are divided into groups of 2-3 people. Each group may also be assigned its own analysis object, to make a collection of different objects.

The exercise kicks off with the first 10 minutes being used to analyse the 'DNA' of the chosen analysis object, i.e. all of the elements that make this example what it is. These essential components are written down in the left column. An example might be the popular, award-winning Norwegian TV series Skam, whose 'DNA' includes the use of amateur actors and the fact that the setting is realistic, the series addresses current problems among teenagers, focuses on a group of girls in a senior high school in Oslo, makes much use of social media off screen, etc. The more of these 'DNA elements' there are, the better the students will be equipped to think new ideas.

Then the students work for 10 minutes in pairs or groups to present alternatives and/or contrasts to all of these 'DNA elements', e.g. unrealistic/fantastical scripts, a changing gallery of characters, internationally famous actors, no use of social media, changing target groups for the series, etc. All these alternatives are noted in the right hand column next to the relevant 'DNA element'. Finally the students spend 5 minutes selecting the most exciting elements from the DNA column and the Alternative column. These selected elements are combined into one overall concept for a new TV series, which is thus based on an existing success, but also contains completely new ideas and elements. Depending on how detailed this combination needs to be to produce a new concept, the students can be given between 15 and 30 minutes for the task. Finally, they return to a plenary session where each group presents its new concept.

Questions for refection after the exercise
What worked well in this exercise? And not so well? How did you choose the 'DNA elements'? Why these in particular? How did you embark on the process of thinking in terms of contradictions and alternatives? How much or how little does your new concept resemble/differ from the model? Why? What makes a concept original? Why? What does this exercise tell you about the role of constraints in creative processes?

Other examples to use in the exercise
Toys (LEGO bricks, Barbie dolls, BRIO wooden toys), literature (Harry Potter, poetry anthologies, lyrics, etc.), design classics (furniture, everyday objects), architecture (Jørn Utzon: Sydney Opera House, Bjarke Ingels: 8 House), etc.

3 *Bad ideas*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture.**
THEME	**1 Ideation**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-60 minutes**
MATERIALS	**Pen and paper (preferably A3), and possibly simple construction materials like LEGO bricks or other crafts materials**

Purpose

To challenge conventional thinking by thinking skewed and alternative thoughts in a structured and entertaining fashion, where the intention is to take a 'detour' in order to achieve a higher degree of originality. The exercise builds directly upon the method developed by Alan Dix and Paula A. Silva, in articular, see Silva: BadIdeas 3.0: a method for creativity and innovation in design (2010).

Description

1) Initial chat in pairs, or a class discussion, for 3-5 minutes, discussing what characterises a good/ successful creative product/design. It could be very simple things such as a plastic tyre lever (so you don't tear a hole in the inner tube when you need to mend a puncture on your bike), or more advanced products such as an iPad, a waterproof/breathable Gore-Tex® jacket, a MobilePay app or an acoustic guitar, etc.

2) This is followed by a plenary session to define what characterises a really bad idea. Introductory suggestions might include a) a cycle helmet made of cotton wool (bad choice of material), b) a toothbrush a metre long (bad choice of scale/proportions), c) chainsaws for kindergarten children (poor choice of target group) and d) an ice hotel in the desert (poor choice of context). It is important to mention these (and any additional) examples as a starter for the next round.

3) The teacher now sets a creative challenge (technically known as a 'design brief'). By way of example, the task used here is to 'Design a seat'. This is a very open task, which could easily lead to unoriginal standard solutions like traditional armchairs, etc. Emphasise that the objective of this exercise is to produce an original and surprising creative end-product.

4) Each group will now conduct an ideas development session for 6-8 minutes, where they are asked to come up with bad, daft or completely crazy ideas which do not have to be about seats. The connection to the brief only comes later, so it is put on hold for the time being. Each group writes all of its ideas on Post-It notes or on a piece of paper (one idea per line or per Post-It note). If the group has the time and inclination, they can make a simple sketch or illustration of their bad ideas. The more ideas (and the worse they are), the better. If the students get stuck, they can be encouraged to think in terms of choice of materials, scale, target group and context. When the time is up, the groups exchange ideas with each other, so each group takes over another group's examples of really bad ideas.

5) Each group now discusses another group's bad ideas for about 10 minutes and selects the two (or possibly three) best, i.e. the funniest and most surprising, bad ideas. The group then takes a piece of paper (preferably A3) and draws a minus and a plus column. For now, only the minus column is used. For each of the two (or possibly three) bad ideas, each group now enters in the minus column everything they can think of which makes the idea so bad. What is the core of the idea? Why is it bad/crazy/useless? Why will it not work?If time is short, the groups are instructed to start analysing the bad idea they think is the most fun.

3 *Bad ideas*

6) The groups are now asked to turn the negative aspects (the minus column) of the selected bad ideas into possible positive aspects. This will take around 10 minutes. An example of a really bad idea could be poisonous sweets. It is definitely not appropriate, unless you want to poison a spy, for example. Helpful questions from the teacher might be: How can you reword the negative aspects of the idea to make them positive? What if you modify the bad idea a little – can that make it good? Can something be changed/ substituted to make the bad idea good? Can some bad ideas be combined to make them good? Are there other contexts in which the bad idea could actually be good (e.g. by moving the poisonous sweets from the context of a 'kids party' to 'espionage')? All of these positive aspects are entered into the plus column on the paper.

7) The groups now continue working with the plus column only, so the minus column is ignored. The aim is to produce even more ideas, as these unexpected positive aspects will later be important sources of inspiration for the original creative problem definition. Elaborating on positive aspects of a really bad idea can be illustrated as follows: A hammer made of glass, for example, is not suitable for flattening joints in metal. On the other hand, it is transparent, so light can pass through it, allowing you to see what you are trying to hit. So a glass hammer may be useful in certain situations where high precision is required, e.g. in the jewellery industry, or when working with even more fragile materials. Another example is that it could be possible to test the tensile strength of a material by hitting it with a glass tool to see whether the glass cracks. 5-8 minutes.

8) The new insights and ideas from the plus column, which students are free to choose from, are now linked to the original creative problem formulation, in this case 'Design a seat', which has been ignored until now. The aim is to arrive at one or more proposals for an original, unexpected and different seat. Students may find it helpful to sketch/draw their ideas/concepts or build them out of LEGO bricks or some other simple building material. The connection to the brief can be illustrated as follows: The example of poisonous sweets has the special property that you feel ill if you ingest them. This property can be transferred in a modified form to a seat. What if you design an armchair in such a way that the user clearly feels something uncomfortable, such as a sharp edge, a corner, an unpleasant surface, etc. if he/she is not sitting properly in the chair? The user is then forced to sit in a correct ergonomic posture, so back pain, tension in the neck, headaches, etc. can be avoided. 15 minutes.

9) Finally, the groups present their ideas to each other in a plenary session. The key point is that the group explains what they have arrived at, and which bad idea and which features of this they have used as a source of inspiration. This takes approximately 10 minutes depending on the number of groups.

Questions for ref ection after the exercise
Was it hard to come up with bad ideas? If so, why? What made them particularly bad ideas, e.g. material, scale, target group, context? What did you do to identify the positive aspects of the bad ideas? Was this change of perspective difficult/easy? Was it hard to switch between opening up to creative possibilities (divergence) and then being specific and targeted (convergence) and having a particular focus in order to achieve a creative end-product?

Other examples to use in the exercise
Wearables (digital technology that can be worn on the body, e.g. smart watches), design a business, clothing, board games, campaigns, advertising, films and art, etc.

4 *Constraints in your own practice*

SUBJECT TYPE	**Language, Design, Visual Art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-60 minutes**
MATERIALS	**PC or pens and paper as well as the material the students have produced in their own projects, which are involved in the exercise**

Purpose
To be able to identify different types of constraints in one's own creative project and challenge and redefine them in order to ensure progress in the process and create a slightly restricted opportunity space, where the students can (and dare to) think freely without losing the overview.

Description
The students start from a project they are already working on, e.g. from a project week or the like, and use constraints analysis to map out some of the most important constraints in this project. These will typically be built-in/imposed/self-imposed constraints.

The aim is for the students to understand and be able to articulate why a creative problem in the project is perceived to be difficult or even impossible, i.e. is the opportunity space too large or too small, what can be changed, what is inherent in the problem, what can be negotiated, be adjusted, loosened, etc. This analysis can be carried out over several rounds, including iterations, so the exercise can be extended to focus on individual analysis, feedback, etc., or be kept more concentrated in a plenary session with a collective constraint analysis.

The students start by individually writing down all of the constraints they can find in their project. This will take them 5 minutes. If the project has been performed in groups, there could then be a round of 10 minutes where the students get together and share what they have arrived at. Then approx. 10-15 minutes can be allowed to select one or two constraints which the students need to change to push their project forward. Where does the constraint come from? Has anyone actually said (ordered) that this restriction cannot be qualified? Or does the constraint come (unconsciously) from the student him/herself? Should the individual constraint be loosened or tightened even further?

The exercise can be structured so the students identify constraints in each other's projects and make a list of constraints, including possible changes to these, to help the other students in their creative process. Here constructive questions are a great help, e.g. "Why did you choose to...?", "Is it absolutely certain that ...?", "Have you thought of…?", "Who decided that...?". The students present the results to each other either in groups or in plenary session. The teacher should emphasise that the students not only have to identify basic types of constraints, but also offer constructive suggestions and alternatives.

Questions for reflection after the exercise
Which of the different types of constraints were there most/least of? Why? Which constraints did you choose as the most important? Why? How did you redefine/challenge the selected restrictions? What seem to be the most difficult types of constraints to work with? Why? How can you transfer your analysis of constraints into your own everyday life?

5 *Build an object inspired by a different domain*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture**
THEME	**1 Ideation, 2 Sources of inspiration, 3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-90 minutes**
MATERIALS	**LEGO bricks, other building materials or pen and paper to draw with**

Purpose
To introduce the students to the importance of sources of inspiration in a creative project, including how the use of sources of inspiration from unexpected and surprising domains affects the process by expanding (divergence) and narrowing (convergence) the student's opportunity space.

Description
The students are asked to design a given object, in this example 'a car'. The students must now incorporate sources of inspiration from a completely different domain, e.g. 'life in the sea'. The exercise can also be conducted by giving each student two small slips of paper on which to write an object/phenomenon/location/domain, etc. The slips are collected in a bowl, and each student must now pull out two slips, with each serving as a source of inspiration. The exercise can also be varied so that note number one specifies the object to be built, and note number two the source of inspiration each student is to use.

Questions for reflection after the exercise
What was difficult in this exercise? How did you use the source of inspiration? Did you find there was much similarity/distance between the object you had to build and the random source of inspiration? How did it affect the process? Why? What does it say about the importance of searching for inspiration?

Other examples to use in the exercise
The students' own hobbies or other personal interests, a piece of furniture, a public space, an everyday object, a business case, app, toy, game, etc.

6 *Design for the future*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture**
THEME	**2 Sources of inspiration, 3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**20-60 minutes**
MATERIALS	**LEGO bricks, other building materials or pen and paper to draw with**

Purpose
To get the students to use their imagination and inventiveness as a creative resource to experiment and play with their expectations for the future. This can be given a personal angle by the teacher (where will the students themselves be 50 years from now?) or a more thematic slant ('global challenges' such as climate change, refugees, famine, etc.). The intention is for the students to feel that crazy/wild/silly ideas and approaches have a creative potential which can be put to use.

Description
The students are set a very open creative challenge: "Design something for the future". They therefore have to rely heavily on their imagination for inspiration. The realism of the concept the students are to arrive at is not important. The more wild and experimental the students dare to be with their ideas, the more fun the exercise will be. The videos below can be used as sources of inspiration which the students are free to choose from. As it can be (very) challenging for the students to create a plausible idea for a future product, the teacher can ask the students to develop a specific future product which must be inspired by one of the video examples. This could be a hightech product built into advanced (indoor) clothing (also known as 'wearable technology'), a new communication system, etc.

- *School of the Future (1960s):* **https://www.youtube.com/watch?v=7p1GfA-oLYA**
- *Golden Age – Somewhere (2012), Paul Nicholls:* **https://vimeo.com/25678978**
- *Productivity Future Vision (2011), Office Videos:* **https://www.youtube.com/watch?v=a6cNdhOKwi0**

1) The students watch the videos with the sources of inspiration and have to choose one of the people to create/design a product for.

2) Depending on the person they have chosen, a new ideation session is conducted in pairs or groups to gather everything the students can think of that could be relevant on the basis of the person and the future scenario shown in the videos. Who is this person? What are his/her needs/wishes/dreams, etc.?

3) The results of the ideation are now used to choose the funniest insights in order to develop a concept for a future product, which the students can visualise with LEGO bricks, other building materials or pen and paper.

4) The students present their final concept in pairs, in groups or in plenary session.

Questions for reflection after the exercise
Is it a desirable or undesirable future you have designed for? Why? Why is the future product not available now? What are the biggest challenges with the future product? Can you compromise on parts of the future product to make it more realistic in our time? Which parts? How?

Other examples to use in the exercise
The students' own hobbies or other personal interests, a piece of furniture, a public space, an everyday object, a business case, app, toy, game, etc.

7 *Circulating inspiration group work*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture**
THEME	**1 Ideation, 2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups**
DURATION	**40-60 minutes**
MATERIALS	**Mobile phone/tablet/PC with Internet access, pens and paper, and a printer if possible.**

Purpose
To find and use the inspiration materials directly and without time for reflection in order to create more original concepts, including the ability to work creatively in a dynamic, improvisational and spontaneous way to tackle a given creative task.

Description
The exercise works best if the teacher does not tell students about the entire process beforehand, so they gain these insights for themselves and have these experiences in the creative process. The main inspiration for the exercise comes from Rohrbach's (1968) classic method '6-3-5 Brainwriting'. The students are divided into groups of three or four. Tables and chairs in the classroom are placed so the students can quickly move around the room and swap places. All groups are asked to come up with a product/concept/idea based on a very open brief. This might be: 'Find a new way to upload images from your mobile phones' or 'Come up with an idea for a new computer game for children'.

1) Each group has to find 4-5 sources of inspiration they think are interesting in relation to the assignment. The students can use mobile phones, tablets or PCs to find these sources of inspiration, which are then drawn/outlined/described in a clear and unambiguous manner. It is important that all four or five sources of inspiration are presented clearly in words and images. For this reason, a printer can be a great help in documenting the sources of inspiration. The students should also have access to paper and pens. This takes 5-7 minutes. The groups are then asked to change places. Each group leaves its new-found sources of inspiration on the table.

2) The students must individually and without talking to each other develop ideas based on the four or five sources of inspiration that they are now seeing for the first time. This takes approx. 5 minutes. Each student writes down all his/her thoughts, ideas and suggestions, e.g. ideas for a solution, related words, words that connect two or more of the sources of inspiration, etc. Then the group is given 5-7 minutes to present and discuss what they have each written down, and to comment on what they find most interesting, what has the most potential, etc. As much as possible from these discussions is written down. This takes approx. 10-15 minutes.The groups then change places again and leave the results of their own group's ideas development on the table.

3) The students are now asked to work in their groups to produce a concept based on the sources of inspiration and the ideas development activity and comments (from the previous group), which are on the table they have come to. The aim is to produce is 2-5 lines of text presenting the concept. This could well be supported by an explanatory drawing or sketch. This takes 10-15 minutes.

7 *Circulating inspiration group work*

4) The students now have to present their concepts. The teacher may choose to let the groups change places one last time, so each group has to present one of the other groups' concepts. Typically, however, it is best for each group to present in a plenary session the concept they themselves arrived at in round 3. This takes approx. 2-3 minutes per group, or maybe more if there are questions and/or feedback from the teacher or the other groups.

Questions for reflection after the exercise
How did you find the process of moving around and using other people's sources of inspiration? What did it do to your creative process? Why? What was the hardest/easiest thing about the exercise? Why? How did you choose the sources of inspiration you ended up using for a concept? What surprised you most about this way of working?

Other examples
A piece of 'wearable' technology, a game, a piece of furniture, a building, a company, etc.

8 *Design for a fictional world*

SUBJECT TYPE	**Language, Design, Visual Art, Innovation, Architecture**
THEME	**2 Sources of Inspiration, 3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**20-60 minutes**
MATERIALS	**LEGO bricks, other building materials or pen and paper to draw with**

Purpose
To get the students to use their existing knowledge, in this case of popular culture, in a constructive, playful and entertaining manner as a source of inspiration in a creative process. At the same time, the exercise gives the students a deeper insight into the world which is described in the selected work/fictional scenario, so it may be appropriate to use this exercise in connection with the analysis of eg. films, TV, books, etc.

Description
The students will be asked to design a given object, such as a new means of transport, which one or more characters in a cartoon, literary work, film or TV series could make use of. The teacher has to assess whether the students are capable of devising an effective fictional scenario for themselves, or whether there should be one common scenario for the whole class. Based on a scenario chosen by the teacher, the students can also decide on the type of object they have to design. One suggestion could be for the teacher to use a book or a film which the students have already worked with on their course, to delve deeper into this universe. The students have to use their knowledge of the fictional scenario, its action and characters as inspiration to design an object for one or more of these characters.

1) The scenario is determined by the teacher, in a plenary session or by the students themselves.

2) The teacher and/or the students designate a character or group in the scenario for the design to be targeted at

3) The students have to develop (wild) ideas for what they see as the needs, challenges or wishes of the fictional character/group. What type (target group) is the character/group? Where does the character want to get to in the fictional scenario? What does the character/group aim to achieve? Why?

4) After this ideation, the students select some of the (wild) ideas, thoughts and suggestions that they find most interesting and are therefore most interested in continuing to work with.

5) The students now have to discuss possible solutions to the exercise. The students may find it helpful to formulate this as a specific question that they must answer: If, for example, Luke Skywalker needed a submarine, what would it look like? Or how about a cloak of invisibility for Wonder Woman? The aim is for the students to work their way forward through such questions, discuss solutions and select a concept to be built in LEGO or other building materials or drawn on paper, depending on the materials available.

6) Students present their final concept in pairs, groups or in plenary session.

Questions for reflection after the exercise
What was difficult in this exercise? How did you use the source of inspiration? How did it affect your creative process? Why? What insights can you take from this exercise?

Other examples to use in the exercise
Various TV series, films and books, e.g. Stranger Things, Game of Thrones, Rick and Morty, Skam, the Star Wars saga, Bladerunner, Harry Potter, Lord of the Rings, James Bond, 1984, Star Trek, Animal Farm, etc.

9 *The six thinking hats*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture**
THEME	**1 Ideation**
PARTICIPANTS	**Pairs or groups (helpful in already existing projects)**
DURATION	**5-30 minutes**
MATERIALS	**Pen and paper or computer to make notes**

Purpose
To introduce the students to thinking in different creative ways, analysing their own projects and taking an exploratory and constructively critical approach to their own creative project.

Description
The Six Thinking Hats (1985) is a well-known and widely used method developed by the philosopher and psychologist Edward de Bono. The method is all about exploring an ongoing project from a number of different, clearly defined viewpoints, which are expressed metaphorically by means of six coloured 'thinking hats'. The exercise can be a bit challenging, but will often give students a clear learning outcome.

1) The white thinking hat is neutral and objective. The focus here is on what is actually there, so emotions and preferences are excluded.

2) Unlike the white hat, the red thinking hat represents emotions and the subjective perspective.

3) The black thinking hat is for the 'devil's advocate' and the pessimist. The focus is on the challenges and negative aspects of the same (ongoing) creative project, which may mean that the project is not going well.

4) The yellow thinking hat is positive and optimistic. The focus is on potential and positive aspects of your creative project. The aim is therefore to generate enthusiasm and hope, so the project can achieve its objectives.

5) The green thinking hat stands for new possibilities and alternatives. The focus here is on what other ways forward there might be, and on creative alternatives to the preliminary solution.

6) The blue hat represents the cool overview and control of the process. The focus here is on what specifically needs to be done in order to reach our goal, what is still missing from the project, and which hats it is important to involve in order to arrive at a creative result.

The teacher can facilitate the exercise a little by way of a role play, where individual students have to behave according to the hat they have been assigned by the teacher (or have chosen for themselves). Alternatively, the thinking hats can be passed around. To underline the importance of being able to change perspective, the teacher can bring in real hats (which can even be a bit silly) as props. If the class is working on a single object for analysis, the exercise can be done in class, where the students are split into teams of six, so each person has his or her thinking hat.

Questions for reflection after the exercise
Was it easy/difficult to wear the different thinking hats? Why? How do you think the exercise went? Which thinking hat was the best/most useful? Why? Which thinking hat was the least useful? Why?

10 *Different small tasks about constraints*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**5-15 minutes**
MATERIALS	**LEGO bricks or other building materials**

Purpose
To illustrate the impact of simple constraints on the way we tackle a creative task, and to challenge the students' perceptions of familiar objects in order to come up with inventive alternatives. The short exercises can be brought out quickly during a lesson if there is time left over, and they are simple to start and run.

Description
The following exercises are different ways in which the student has to try to get around the critical constraint which is built into each exercise. The intention is for the students to try to complete the exercise by interpreting the constraint in the material in an alternative way, or by completely ignoring it. The small LEGO exercises can be used as short creative activities, either as part of the key themes 1-3 or as spontaneous, isolated activities, which can easily be incorporated into other subjects to create a dynamic teaching situation.

Suggestions for small tasks:
- *Build a fruit using only blue LEGO bricks*
- *Build a car without using round bricks or wheels*
- *Build a specific object with as few bricks as possible (e.g. a snake, duck, fish, etc.)*

Questions for reflection after the exercise
Which constraints constrained you? Why? What was the hardest/most annoying constraint to get around? Why? How did you solve the problem? What was difficult/easy about this exercise? How can the experience from this exercise be transferred to the creative challenges and tasks in your own everyday life?

11 *Exstreme characters*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**1 Ideation, 2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-60 minutter**
MATERIALS	**LEGO bricks or other building materials, paper and pen**

Purpose
To introduce the students to working with (fictitious) personas in the form of extreme people/characters in order to expand their creative possibility space. The students also experience the switch between a broad, exploratory and imaginative perspective (divergence) and a specific focus and link to an actual creative task (convergence).

Description
This exercise is based directly on the design method Extreme Characters (Djajadiningrat, Gaver & Frens, 2000), which was developed within design research. The students are divided into groups and set a creative task (a design brief): Design a digital tool/aid to organise your day (e.g. to set up and share appointments in a calendar) or perform a specific task (e.g. shopping, planning a trip, etc.) for a particular extreme type of person/character (e.g. Father Christmas, a bank robber in the Wild West, an astronaut, the Queen of Denmark, etc). They may also be characters from books that the students have read (e.g. classics, Harry Potter), a work of art or people from popular culture that the students already know a lot about, and who have unusual characteristics, a special role in society or something like that, which makes the person distinctive and easily recognisable. To facilitate the design process, we recommend running the exercise in the following steps:

1) Each group chooses a person/character for whom they will make the design. Now they must conduct a shared group-based ideas development session lasting 7-10 minutes focusing on what type of person their chosen person/character is: What might they like/dislike? What do they do? What kind of people do they surround themselves with? What problems or challenges do they face? What is most important to them?, etc. This is written down on a piece of paper. The students can be encouraged to work visually with a kind of 'persona-map' in the style of a mind map, where the chosen person/character is written or drawn in the middle. They then draw lines to smaller circles with relevant and interesting words/concepts/short sentences, which can also be linked thematically to each other (in research terms, referred to as 'clustering'). The students can then get an overview of the person/character more quickly.

2) Next, the students select the character traits, features, etc. that they think would be most interesting to work on in their response to the creative task. This takes approx. 5 minutes.

3) The third round is an ideation phase. The groups have to come up with ideas for a solution to the original creative task, but focusing on a target group with the particular extreme character traits that the group has just selected. How would Harry Potter use a calendar, for instance? How would it be if he could magically insert events into the calendar, or if the actual events entered themselves? The aim is to expand the students' opportunity space, so they are forced to avoid obvious and ordinary solutions by looking at extreme situations and people/characters. Each group should write down as many ideas as possible. This will take them 8-10 minutes.

11 *Exstreme characters*

4) The last step is to select one idea from the ideas development session, and to elaborate on it in more detail, perhaps with a sketch, with a view to presenting it. It is important for the students to continue to work on the basis of an extreme perspective – they must not reduce the 'wildness' of the idea to make it easily feasible. This takes approx. 8-10 minutes.

5) The groups present their ideas and perhaps their sources of inspiration in plenum.

Questions for ref ection after the exercise
What was difficult/easy about the exercise? Why? How did you find more information about your chosen character? Was it difficult to switch between opening up options and then being specific and having a definite focus?

12 *Find inspiration in the design material*

SUBJECT TYPE	**Design, Visual Art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups**
DURATION	**5-15 minutes**
MATERIALS	**LEGO bricks, orther building materials or any other physical object**

Purpose
To introduce the students to the importance of being able to 'drill down' and 'zoom in' and find possible sources of inspiration in seemingly ordinary and uninteresting objects and phenomena, so these insights and ideas can be used constructively in other creative processes.

Description
The students are given an object chosen by the teacher beforehand. Alternatively, the students must find an object, e.g. in their bag, in the room, in the school, etc. The students now have about 5 minutes to write down everything they can think of when they see and interact with the object. Is it heavy/light/hard/soft/expensive/rare/advanced/simple/widely applicable/wellknown/new/used/efficient/redundant/necessary/luxurious, etc? Everything the students can think of when they see and touch the object is written down.

Then the results are shared with their neighbour or the rest of the group. The aim is for the students to arrive at two points: What is the essence/core function of the object, and what could be different and more appropriate about the object, e.g. in a usage situation? An example might be a thermos cup with USB charger socket for hiking. The thermos cup keeps the coffee hot (the essence of the object), but as the cup is designed for outdoor use, a USB charger socket for a PC is hardly the best solution (inappropriate) when the cup is taken on a hike. The exercise can thus be extended to involve a design perspective where the students need to redesign the object and give it a new essence, function, context, form, etc.

Questions for reflection after the exercise
What type of sources of inspiration did you find, e.g. primarily form or primarily function? Why? Did you find that you moved a long way away from your normal perception of the object? How? Why? What surprised you the most? What ideas can you take with you into other creative projects? Why are these ideas relevant here?

Other examples to use in the exercise
The students' own hobbies or other personal interests, a piece of furniture, a public space, an everyday object, a business case, app, toy, game, etc.

13 *Too many options*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**15-20 minutes**
MATERIALS	**LEGO bricks or other simple building materials**

Purpose
To illustrate how important creativity constraints are in a creative process, and why (too) great creative freedom, and hence too few constraints, is rarely a definite advantage in a creative process.

Description
The students are asked to build something specific which is defined in a deliberately vague manner. This could, for example, be to 'Build a new machine'. The students are not told what the machine is supposed to do, how long they have, etc. This can run for approx. 10 minutes. The very open task will normally trigger some frustration and confusion, because the opportunity space is not at all limited, which can lead to the psychological state of 'paradox of choice' where too many choices can lead to a certain paralysis. It is wrapped up in a plenary session, where each pair or each group present their machine.

This exercise can be combined with exercise 14 (next page), where the students are faced with a creative task where there appear to be far too few options. This combination will enable reflection on the significance and importance of being able to work with different types and degrees of constraints. It can be expressed as either a very open or a very narrow opportunity space.

Questions for ref ection after the exercise
What was difficult about the exercise? Why? What does it say about problem-solving, constraints and opportunity spaces? What creative choices did you make in order to get started on solving the problem? How did you work together on these choices? Did these choices seem good/bad? How surprising/new/original and effective/smart/appropriate do you think your machine is? Why? How can originality and usability be understood from the role of constraints?

Other examples to use in the exercise
Business, text genre, furniture, wearable technology, invention to help in the fight against poverty, famine, etc.

14 *Too few options*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**15-20 minutes**
MATERIALS	**LEGO bricks or other simple building materials**

Purpose
To illustrate how important creativity constraints are in a creative process, and why (too) little creative freedom and hence too many constraints can make it harder to deliver exciting solutions to a creative task.

Description
This time the students are asked to create something specific which is very narrow, e.g. 'Build a machine to save lives and only use the red and blue LEGO bricks'. In this exercise they are given a definite and ideally tight time limit. This could be 5-8 minutes, for example. Unlike the exercise with 'too many choices', this time the students will find it hard to get started on the exercise, because the opportunity space is defined very narrowly. When the students begin to build, they will experience another type of (constructive) frustration, because they constantly have to compromise and run into a number of dead ends. For example, they may find they have to reject a particular LEGO brick, which would otherwise fit just perfectly into the machine they are building, because the brick is not blue or red. After the building exercise the teacher wraps up in plenum, and each pair or group presents the model they have built.

This activity can be combined with exercise 13 (former page) where the students are faced with a creative task where there appear to be too many options. This combination will enable reflection on the significance and importance of being able to work with different types and degrees of constraints. It can be expressed as either a very open or a very narrow opportunity space.

Questions for reflection after the exercise
What was difficult about the exercise? Why? What does it say about problem-solving, constraints and opportunity spaces? Why it is surprisingly difficult to have so many constraints? How is it difficult? How did you start on the task? When did you get stuck? Why? How surprising/new/original and effective/smart/appropriate do you think your machine is? Why? How can originality and usability be understood from the role of constraints?

Other examples to use in the exercise
Design a smartphone where you are not allowed to use the swipe function or the Home button, and which can be used safely while riding a bike, devise a business which works with sustainable paper products which can be used outdoors, make a chair in the style of Arne Jacobsen where the seat and legs are made of glass, etc.

15 *Recycling design materials*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration, 3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**20-60 minutes**
MATERIALS	**Specific LEGO sets or other building materials that already have a specific function that involves combination**

Purpose
To introduce the students to identifying constraints and challenging preconceptions of what something 'can do' or 'is suitable for' in order to be able to expand an apparently narrow opportunity space via a more nuanced understanding of the creative constraints.

Description
The students are divided into groups of 3-4 people. Each group is given a set of building materials, such as a LEGO Duck set. This particular LEGO set is made specifically to build the classic LEGO duck, but the students are now asked to build e.g. a chair, a cake or a means of transport from the six yellow and red LEGO bricks. The bigger the specific set of selected building materials, the greater the degree of completion that can be achieved. In this example, it is important for the teacher not to give the students too many LEGO bricks, as the students need to try to get the most out of the available materials by rethinking their options. The point is lost if the students have a very extensive and varied LEGO set which can easily be made into other objects than the original intention of the LEGO set. The students are given 10 minutes to build something new. This can be extended depending on the amount and difficulty of the chosen building materials.

Questions for ref ection after the exercise
What constraints were present in the building materials? What did you add/ remove? Why? What surprised you most about using the materials in a completely new way? Can you think of other examples where objects have been used to positive effect in completely different ways than what they were designed for? What was easiest/hardest about the exercise? Why?

16 *Reinvent the wheel*

SUBJECT TYPE	**Language, Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Individual, pairs, or groups**
DURATION	**15-30 minutes**
MATERIALS	**LEGO bricks or other simple building materials, pen and paper**

Purpose
To introduce the students to the importance of sources of inspiration in a creative project, and how sources of inspiration can both extend and limit the opportunity space in a creative process.

Description
The students have to 'redesign' familiar objects so they acquire a (more or less) new and different function. The existing object should inspire the students and give them a foundation, so that they can combine their own knowledge of the object with new objects and phenomena. This can also be done with literature, film, theatre, architecture, visual art, etc. in such a way that the students have to transfer the narratives into a new context.

1) The object which is the starting point for the exercise is determined by the teacher, jointly with the class or by the students themselves.

2) The students are now asked to write down everything that occurs to them when they think about the object: What can it be used for? What are the advantages and disadvantages? What about its hidden potential, new applications, other users, etc? This ideation step takes around 3 minutes.

3) The students then select the elements from the ideas development they find most interesting to work with. This takes approx. 3 minutes.

4) Many people have a tendency to stay within their original domain when searching for sources of inspiration. We therefore recommend inserting a point here where the students are encouraged to look in quite different domains to find additional sources of inspiration, which can then be combined with the elements they selected from the preceding ideas development activity. The goal is to find even more new angles on the familiar object. This takes approx. 3 minutes.

5) The students now have to come up with a 'redesign' of the object based on the sources of inspiration and ideas that they chose from their ideation session. This redesign can be illustrated with LEGO bricks, other construction materials or sketches. This takes approx. 15-30 minutes.

6) Finally, the students present their redesign in a plenary session where the teacher and the other students can ask questions.

Questions for reflection after the exercise
Was the exercise easy or difficult? Why? Why is it (not?) a good idea to rethink and change classical and familiar objects? Do you know any examples of redesigned products or services? Do you prefer the original or the new version of the object? Why? Is the new version something you could use? What sources of inspiration did you use?

Other examples to use in the exercise
Equipment from the students' own hobbies or other personal interests, furniture, tools, apps, public spaces, everyday objects, business cases, etc.

17 *What if?*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Individual, pairs, or groups**
DURATION	**30-40 minutes**
MATERIALS	**Digital tools (Google Docs, Evernote, Pinterest), pen and paper, Post-it notes. Smart phones or tablets can also be included.**

Purpose
To teach the students to be able to seek out, identify and categorise sources of inspiration in different domains and use them as a resource in your own creative practice.

Description
This exercise can be used when the students are starting a project which requires them to come up with original ideas which they can use as a resource in the creative process. The exercise assumes that the students have already been set a very open task, such as devising a sustainability activity or creating a product/concept for sharing travel experiences. To help the students to get started on this process, focus will be on the use of sources of inspiration and the ability to distinguish between using sources of inspiration far away from, or close to (or even in), the student's own domain for the project. The students can then create a catalogue of sources of inspiration as a creative resource in their project. A suggestion for a project could be, for example, that the students have to come up with a new service app, i.e. an app that can make their everyday lives a little easier by solving a specific problem. This example is used in the description below.

1) The students are asked to individually find three apps on their mobile phones which they use every day and which help them in one way or another. These apps are thus close to the students themselves and their own domain; in this case, their daily lives. This is documented with a description of the three apps and the reasons why the three apps work well. A photo or other illustration can be added. This takes approx. 5 minutes.

2) The students must now individually search more widely and find three new apps that they think look interesting but which they don't yet know so well or have installed on their mobile phones. They need not necessarily be service apps, but could be mobile games, etc. These three new apps are thus slightly distanced from the students themselves and their original domain, including what they are accustomed to using, but without being totally foreign to them. This takes approx. 5 minutes.

3) The students must now individually find one other domain to search for sources of inspiration, and these should not be more apps. It could be the plant kingdom, wildlife, architecture, fashion, art, culture, etc. Here, they must each find three things that they find surprising, fascinating, smart, beautiful, etc. This could be run as two rounds if there is time for the students to look in two different domains. This takes approx. 5-7 minutes.

4) The students will now each have three times three sources of inspiration (i.e. three familiar apps, three new apps and three additional sources of inspiration). The students must now individually develop ideas for how these sources of inspiration can be incorporated into their original project. This could be done by asking a number of "What if ...?" questions. For example: A student would like to be better at remembering small tasks and jobs and wants to create a new service app. As a source of inspiration, the student takes the mimosa plant, which closes up when touched.

17 *What if?*

The student plays around with this idea with the help of “What if ...?” questions and comes up with a concept of a reminder app (also called a to-do app) shaped like a colourful plant where the tasks open and close as the student keys them in and then completes them. By getting away from a dull view of a list of tasks, this new service app is easier and more fun to use, so the student will find it easier to get used to consistently using the app. This takes 10-12 minutes.

5) The students must now bring their sources of inspiration into a group task, where they present their sources of inspiration, and their potential in the original project, to each other. It is important for the students to give each other feedback and additional ideas, e.g. with more “What if ...?” questions. After the group work, each student chooses one or two ideas, which are then included in the continued individual project work. This takes about 10-15 minutes, depending on group sizes.

Questions for reflection after the exercise
Which round was the hardest/easiest? Why? Where did you search for sources of inspiration? Why here in particular? How was your creative process influenced by the distance of the source of inspiration from your original domain? Why? Why is it important to be able to immerse yourself in your own domain, while deliberately searching other domains for inspiration?

Other examples to use in the exercise
A piece of furniture, a public space, an everyday object, a business case, etc.

18 *What were they thinking about?*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**1 Ideation, 2 Sources of inspiration**
PARTICIPANTS	**Individual, pairs, or groups**
DURATION	**5-15 minutes**
MATERIALS	**Pen and paper (can be omitted if the exercise is conducted orally)**

Purpose

To make the students aware that all creative end-products arise out of a development process in which sources of inspiration have played a crucial role, and where those involved have had to make a number of choices, one way or the other. It is also important that the creative processes do not proceed in a strictly logical or linear manner, but always leave room for some uncertainty and experimentation.

Description

The students are asked to imagine what thoughts, sources of inspiration, objects and activities they think are likely to have gone into a specific creative product. Here, it may be helpful for the teacher to have selected one or more such products beforehand, to ensure a direct connection to the individual subject, but the students can also choose an example which they find interesting. It could be an iPhone, Arne Jacobsen's 'Swan' chair, Jørn Utzon's Sydney Opera House, a film, a music album, a painting, etc.

19 *Know your user*

SUBJECT TYPE	**Language, Social studies, Design, Visual art, Innovation, Architecture**
THEME	**1 Ideation, 2 Sources of inspiration**
PARTICIPANTS	**Individual, pairs or groupwork**
DURATION	**60-120 minutes (can be arranged as homework for the students)**
MATERIALS	**Various**

Purpose
To train the students to ask constructive questions in a creative process and use (alternative) tools and materials to gather insight into, and inspiration from, a specific user group and their lives, experiences, needs and dreams.

Description
This exercise can be used at the beginning of a project where the students have to come up with original ideas they can work with in the creative process. The students have thus already been set an open task, e.g. 'Devise a new business/product/service/app/tools, etc.'. This exercise focuses on taking inspiration from potential users' everyday life and is directly inspired by the commonly used design concept of 'Cultural Probes' developed by Gaver, Dunne and Pacenti (1999). The concept is based on the creative person on a project, such as a designer (here, a student) producing a small package with a set of simple tools and materials. This small package is then given to the user into whose life and needs we want to gain greater insight. The intention is for the user to use the little package to document their everyday life. There might be a map of the user's city, for example, where the user has to mark on the map where he/she goes most often, where they do not dare to go, where they would like to go, etc. There may also be a little diary with some headings entered beforehand to show what we want to know about the user: who he/she talked to today, what they had for dinner, what they watched on TV, etc. There may be small tasks in the kit, e.g. the user of the kit might take (mobile) photos of specific objects/places/situations or add elements to the kit when it is finally returned to the sender, typically a designer (here, a student).

The students' task is thus to make up such a 'cultural probes' kit, which they can give to a particular person representing the target group that the students are working with in the project, such as a friend, a family member, a football coach, etc. The aim is to gain an insight into this person's everyday life and obtain documentation and hence new insights from this. For example, the teacher can use the example task from the "What if ...?" exercise, where the students have to create a service app to make the user's everyday life a little easier. The kit must be designed so the students can gain an insight into the user's everyday life. The kit should therefore include simple, short assignments, such as: 1) take photos of things in your daily routine that annoy you and send them with a two-line description to my email [insert email address]; 2) mark on the enclosed printed map of [insert city name] where you think it is unsafe/exciting/nice to be and write on the back why; 3) fill in the small enclosed folder with details of the items you have used today, what you have used them for, and what you didn't have today, etc.

Questions for reflection after the exercise
How did you choose your user and hence your target group? Why? What thoughts did you have in relation to the choice of documentation material and tools for the set? What was the hardest/easiest thing about the process? Has it given you fresh understanding? Did anything surprise you? What did you expect to happen? Did it happen? Why (not)?

20 *Sources of inspiration in your own practice*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups (in already existing projects)**
DURATION	**30-60 minutes**
MATERIALS	**PC or pen and paper as well as the material the students have produced in their own projects**

Purpose
To be able to identify different types of sources of inspiration in the student's own creative practice and to redefine and exploit them further, so that they can continue to contribute constructively to the student's future work on a given project.

Description
The students start from a project they are already working on, e.g. from a project week or the like, and make an analytical map of some of the most important sources of inspiration in the project. The aim is to clarify why a creative problem in the project is perceived as difficult – too many or too few possibilities, what can be changed, what is fixed in the problem area, what can be negotiated, etc. – and how sources of inspiration can help here. This can be run over several rounds, including iterations, so the exercise can be extended to focus on individual analysis or run in a plenary session with a collective analysis of the sources of inspiration, including constraints.

The students start by individually writing down all of the current sources of inspiration they can find in their project. This takes approx. 5 minutes. If the project has been done in groups, there could then be a round of about 10 minutes where the students return to their groups and share what they have arrived at. Then approx. 15 minutes can be allowed to select one or two sources of inspiration which the students need to change to push their project forward. Should the source of inspiration be opened up, for example, by being interpreted more broadly? Are there aspects/possibilities in the source of inspiration which they have overlooked? Or is the source of inspiration being used too broadly, and hence ineffectively, because the student is including too many features, so the interpretation of the source of inspiration needs to be narrowed?

The exercise can be expanded so the students also have to analyse each other's projects and prepare a list of the sources of inspiration that they think have been, or could be, most relevant to the other student's project. This could involve suggested changes to these with a view to helping other students in their individual process. The students present the results to each other. It is important here not only to identify sources of inspiration, but also to make constructive suggestions.

Questions for reflection after the exercise
Which of the different types of sources of inspiration were there most/least of? How did you work to redefine and reinterpret your chosen sources of inspiration? What worked (or didn't work)? Why? What seem to be the most difficult types of sources of inspiration to work with? Why?

21 *Combinational creativity*

SUBJECT TYPE	**Language, Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-60 minutes**
MATERIALS	**Various, perhaps including random objects the students have brought with them or pictures of different objects prepared by the teacher**

Purpose
To introduce the students to rethinking the properties of something that already exists, and to show that it can be given new life by 'forcing' creativity through a structured combination of different properties of random objects, materials, etc.

Description
The students are divided into groups of two to four people. Each group must choose two objects/materials/notes/photos. If you can hide these, e.g. in a container, so they are chosen at random, it will be more fun. The students now have to combine the two objects in a way that results in a new and surprising product. To facilitate the process, we recommend splitting it into the following steps:

1) After selecting two objects, each group is asked to draw three columns on a piece of paper. The names of the two objects are written at the top of the left and right columns (the middle column is used later). For the next 5-10 minutes, each group has to examine each of the two objects: What can they do? What are they used for? What are they made of? What do they look like? Can they be used in contexts other than what they are intended for?

2) The groups now spend 8-10 minutes choosing one or more properties and insights from each of the two outer columns (for the selected objects) and together try to combine these pieces into new ideas. An example might be a raw potato and a date stamp, whose properties can be combined into potato printing. These combination ideas are written down in the middle column. The teacher should emphasise that all ideas are welcome – there is no such thing as 'a bad idea'.

3) In the third phase, each group has to choose one or two combination ideas, which they now turn into a sketch with additional details of use, target group, purpose, etc. The aim is to present their solution(s). This takes 10-15 minutes.

4) The groups present their sketches and explain what features of the objects they are based on. One or more types of feedback are also recommended.

Questions for reflection after the exercise
What was difficult/easy about the exercise? Why? Why can it be an advantage to start from existing objects? Can there be any disadvantages to this approach? Was it hard to switch between opening up to creative possibilities (divergence) and then being specific and having a particular focus (convergence)? Can the students give examples of inventions, designs, etc., which are clearly based on a combination of two or more existing objects, features, materials, etc.?

Other examples to use in the exercise
The teacher can also choose to use random generators such as **www.boredbutton.com** or **www.theuselessweb.site**, etc. to select two websites for the groups to combine and make into something new and useful.

22 *Mapping out the domain for inspiration*

SUBJECT TYPE	**All subjects**
THEME	**1 Ideation, 2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups**
DURATION	**30-60 minutes**
MATERIALS	**Digital tools (Google docs, Evernote, Pinterest), pen and paper. Also magazines, books etc. which can be cut out, glue, scissors, etc.**

Purpose
To teach the students to select and combine what they judge to be the most important information and further inspiration within a subject or domain in order to be able to communicate a topic clearly in a creative process. The creative decision-making process can be seen as convergence (as opposed to divergence).

Description
This exercise can be used to find inspiration for major written assignments or exam preparation, e.g. in History, Social Sciences, English, Languages, or more practical subjects such as Design, Architecture, Innovation and Visual Art. The students are divided into groups. Each group gets a topic from the syllabus in the associated subjects. Key elements could include important dates, genres, concepts, cultures, religions, phenomena, etc.

Each group now has to develop an inspiration chart (perhaps as a collage of text and images on an A4 page) for the assigned topic. The inspiration chart has two purposes. It should capture the most important aspects of the assigned topic for exam preparation and what the students are expected to be able to remember. It should also provide inspiration for future assignments in the relevant subject, where the students can help to determine the topic, angle and focus.

Questions for reflection after the exercise
Was the exercise easy/difficult? Why? How did you decide what you wanted on your inspiration chart (collage)? Which topics did you discuss? How did you select/prioritise them? Why?

23 *LEGO duck challenge*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration, 3 Constraints**
PARTICIPANTS	**Individual or pairs**
DURATION	**15 minutes**
MATERIALS	**Classic LEGO Duck set of six yellow/red bricks (see slides) and smart phone. Other small LEGO sets or building material can be used.**

Purpose
To get the students to draw on their individual knowledge and use it as a direct inspiration. Also, the students often find that new, alternative sources of inspiration can have a positive effect on a creative process, underlining the importance of using sources of inspiration.

Description
All students get the same set of building materials, in this case the LEGO Duck set. The exercise is presented and controlled via the slide show for exercise 23 and 29.A.

1) The students are asked to build as many different ducks as they can with the six LEGO Duck bricks. For each duck that the students build, they can take a photo with their mobile phone camera as documentation, so they can more easily tell at the end how many ducks they managed to build. This takes approx. 5 minutes. When the time is up, count the number of the LEGO ducks. The teacher could ask in the plenary session who has built the most ducks. You could also count how many ducks the class has built altogether.

2) The slide show is used to display strange, surreal and funny interpretations of ducks as further inspiration. This takes approx. 1-2 minutes. The students are now given another 5 minutes to build even more ducks; after seeing the additional sources of inspiration, these will (hopefully) be a little more wild and inventive. Again, the students can take photos of the new ducks. Between round 1 and round 2 the students could also take a photo of the table, so they can easily distinguish between the ducks from the two rounds.

When the time is up, count the number of the LEGO ducks. Again, the teacher can ask who has built the most. You could also count how many ducks the class has built altogether, and compare the two rounds.

Questions for reflection after the exercise
Which round was the easiest/hardest? Why? Did you have any strategies for building the ducks? How did you make sure that the ducks were different? In terms of the number of ducks, did it help to get new (strange, funny) sources of inspiration? Why (not)?

Other examples to use in the exercise
If LEGO bricks are not used as building materials, the exercise could focus on e.g. people, houses, activities, plants, chairs, etc.

24 *Marshmallow challenge*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**20-30 minutes**
MATERIALS	**Envelop containing: 20 sticks of uncooked spaghetti, 100 cm masking tape, 100 cm yarn/thread, one marshmallow (the soft white kind)**

Purpose
To teach the students to be aware of and able to work with important constraints in materials and the design brief throughout the creative process. The exercise is particularly suitable as a starting point for a discussion of roles and responsibilities in creative processes, which may be relevant for the students in relation to creating and elaborating a clear shared understanding of 'good group work' and the creative skills the students are strongest in. It may be a good idea to prepare the exercise with the teacher having already created a 'kit' with the necessary materials for each group.

Description
Tom Wujec has enhanced this exercise from a suggestion by Peter Skillman. The exercise has been used worldwide in connection with collaboration and creativity (and no doubt much more). The background to the 'Marshmallow Challenge' is described in Tom Wujec's TED Talk, which the students will enjoy watching when they have tried the exercise for themselves. The video is in English, but can be viewed with various subtitles:

https://www.ted.com/talks/tom_wujec_build_a_tower?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare

The students are divided into groups of 3-4 people. The task is simple: The students have to build the tallest tower they can with the materials. Nothing else. They can break the sticks of spaghetti, tear the masking tape and yarn/thread into small pieces, glue the spaghetti to the table top, etc., but they cannot use any additional aids. However, there is one important constraint: The marshmallow must sit/lie on top of the spaghetti tower. The group that can build the highest free-standing (i.e. no supporting hands) spaghetti tower with a marshmallow on top in 18 minutes has won. As Tom Wujec explains, the vast majority of groups spend too long on construction plans and completely forget the marshmallow. So they save it to the end, and when the marshmallow is placed on the spaghetti tower, it collapses – to the great amusement of the rest of the class. The most appropriate way to tackle the problem is through 'prototypes', i.e. regular tests where the marshmallow – the crucial constraint – is always considered and involved in the creative process. It is important to pick up this learning outcome in plenum, perhaps by showing Tom Wujec's TED Talk.

The Marshmallow Challenge thus has a certain competitive element, but it is important to emphasise that it is first and foremost an entertaining exercise which is not meant to be divisive, but rather provides students with an enjoyable and instructive shared experience.

Questions for reflection after the exercise
What was easy/difficult about the exercise? What types of constrains were present? How did you work with the constraints? Did you divide up the tasks? Who did what? Why? What roles were there? How did you structure the 18 minutes? Why? What could you do differently? What insights from the exercise can you take into other contexts?

Other examples to use in the exercise
With LEGO bricks, a related exercise might be for the students to build a bridge between two points, such as two tables, where the bridge must be able to bear a ½ litre bottle filled with water. The students again have 18 minutes to complete the task. Wrap-up in plenary session.

25 *Framing a project with inspiration search*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Pairs or groups**
DURATION	**20-40 minutes**
MATERIALS	**PC and/or phone, pen and paper**

Purpose
To teach the students to search, identify and categorize sources of inspiration, and use them in their own practice. This assignment can be used when students are to start a project that requires them to find original ideas that they can work with in a process where this can be used in the initial phase.

Description
The students have already been asked an open task - find a company or product. To help students get started with this process, the focus should be on the use of inspirational sources and the ability to distinguish between using sources of inspiration far away from the domain of the given task or near the given domain. The students will then be able to create a catalog of inspirational sources that they can use in their project. A project proposal might be that they should find a service app, ie. An app with a feature that can make your everyday life easier.

1) 5 min: Students are asked to individually find three apps on their phone that they use in their daily lives and help them in one way or another. It is thus close to themselves and their own domain. It is documented with links, a little description and a corresponding picture.

2) 5 min: Students are now asked to look broader and find three new apps that they think look interesting and have not installed on their own phone. It is thus somewhat spaced from themselves and what they are used to, but not too far away from the domain.

3) 5 min (possibly x2): Students now have to choose another domain to find inspiration sources and not find more apps. It may be, for example from the plant kingdom, wildlife, architecture, art, culture, etc. Here they will find three things that they think are fascinating, weird, smart, beautiful, etc. This can be divided into two rounds if there is time for the students to search in two domains.

The students will now each have 9-12 inspiration sources, which they can carry on in their group work. Additionally, there can be added a round where they present their sources of inspiration for each other and choose from them, what they want to work on.

Reflection questions after exercise
Which round was the hardest / easiest? Where did you look for inspirational sources? Why did you just choose these sources of inspiration?

Other examples
Furniture, public space, everyday objects, business case, etc.

26 *Back to back*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**5-10 minutes**
MATERIALS	**LEGO bricks or other building materials**

Purpose
To introduce students to examples of creativity constraints, specifically how communication in a creative process can be a challenge if the people involved do not (quickly) establish a common language and a clear understanding of the concepts.

Description
Each pair is given 2 identical sets of the same type of building materials, i.e. with the same number of elements of the same size. They could be two identical sets of six LEGO bricks, which can be chosen as three 2 x 4 bricks in three different colours, one 2 x 3 brick and two 2 x 2 bricks in different colours. The six yellow and red bricks in the LEGO Duck set can also be used, and other similar building materials also work well. The students are now told that one of them must build something out of the bricks which he or she has been given. The younger, here called person 1, in each pair begins.

Person 1 gets 3 minutes to build something out of the six LEGO bricks while they are both sitting/standing back to back, so person 2 cannot see what person 1 is building. When the 3 minutes have passed, person 1 now has to describe what he/she has built, but without showing what it is. Person 1 must then guide person 2 so person 2 can try to build an identical model with his/her own LEGO bricks. This takes approx. 3-5 minutes. When the time is up, persons 1 and 2 can see each other's results.

Questions for reflection after the exercise
What creativity constraints were at play here? What was easy/difficult when person 1 had to instruct person 2? What did you do to quickly find a common language? Was it effective? Could you have done anything differently, e.g. if you only had half as much time for instruction? Can this scenario be transferred to other situations from real life?

27 *Write a poem*

SUBJECT TYPE	**Language, Design, Visual art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Pairs or groups**
DURATION	**10-15 minutes**
MATERIALS	**PC or pen and paper**

Purpose
To illustrate the importance of creativity constraints for a creative process, and why it is important to be aware of how constraints can be handled, and how they can even be seen as a resource in a creative process.

Description
The teacher gives the students a simple creative challenge: "Write a poem in English" (or another subject language) without any further instructions. The students will often be a little frustrated and confused by this vague task, but this is good for their learning outcomes, so it is important for the teacher not to provide more information or tell the students how long they have for the task. Because the students' opportunity space is very little constrained, they will typically either write an uninspired and banal poem ("roses are red, violets are blue ...") or experience the psychological state of 'paradox of choice', where too many choices can cause paralysis.

After the students have read their poems to each other in pairs, the teacher asks the students in plenum to choose three nouns, two verbs and one other word, such as 'weekend, telephone, friend, run, laugh, red'. The teacher now asks the students again to write a poem, but this time there are far more rules: All six selected words must be included in the poem (they may well be modified in terms of singular/plural or tense), which also must be structured as five lines of five words each, etc.). This time the students will find that the many constraints give a completely different creative process, which is more reminiscent of creative problem-solving than poetry. This is because the opportunity space is much more limited, and the students have to spontaneously adopt various strategies to work with the many constraints, to finish the task within the allocated five minutes.

The exercise can be coupled with exercises 13 and 14, which also focus onthe ability to work constructively with either (too) few or many constraints in
a creative process.

Finally, this is picked up in the plenary session, where the students discuss the effect of such constraints things, i.e. the dual role whereby constraints both enable and narrow down the opportunity space. The students can read their poems out to the whole class or in groups.

Questions for reflection after the exercise
Which round of poetry writing produced the most fun/silly/surprising/original poem? Why? What does this tell us about the role of constraints in the creative processes? Can you think of any examples of constraints which have been helpful to you in a given context? How can the difficulty of writing a completely free assignment be understood in the light of this exercise, for example?

Other examples to use in the exercise
Advertising text, slogan, short story, rap/song, battle cry, etc.

28 *Simple and short tasks about constraints*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**3 Constraints**
PARTICIPANTS	**Individual, pairs, or groups**
DURATION	**5-15 minutes**
MATERIALS	**Pen and paper**

Purpose

To make the students aware of the impact of simple constraints and unconscious preconceptions on the way in which they perform a creative task. The aim is to teach the students not to look for answers or solutions right away, but rather to start by looking for questions and exploring the problem as an effective way of challenging their habits and systematically thinking in terms of creative alternatives. These small exercises can be quickly incorporated into the teaching if there is time left, and they are easy to initiate.

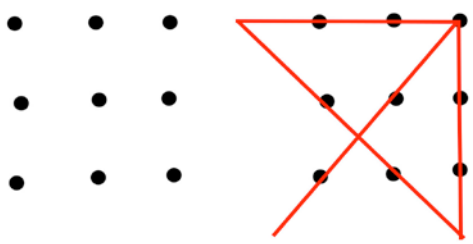
Description

These small exercises are based on different sequences, puzzles and riddles primarily developed at the International Center for Studies in Creativity (ICSC) at Buffalo State College, State University of New York. This field of research is known collectively as CPS (creative problem solving). There is research evidence to support the assertion that "If you only have a hammer, every problem looks like a nail". It is therefore crucial to sharpen the students' awareness of the importance of examining any creative problem in depth from as many different angles as possible, so they avoid 'blind spots' and come up with genuine creative solutions. In creative assignments the first instinct rarely produces the best result, so it is important to learn to challenge the apparent constraints in a constructive and structured manner. The learning outcome is to practice looking for questions, not answers. There are many exercises of this kind on the Internet, so this exercise can be expanded so the students have to find such creative puzzles for each other as a way of challenging each other's thinking in a constructive, and often entertaining, way. This section presents various examples of such creative learning exercises where the answer typically takes the form of "Yes, of course!" or "Ah, now I get it!".

28.a. The nine dot problem

The students are asked to draw a square of 3 x 3 dots on a piece of paper. They are then told that they have to join all the dots with four continuous straight lines, without lifting the pen from the paper. The teacher then starts the clock – typically 5 minutes. The vast majority will try to find a solution within the square. There is no such solution. The solution involves drawing outside the square, which not many people will do. This illustrates the unconscious constraints and assumptions we always bring to a creative task, which prevent us from achieving a higher degree of originality in the proposed solutions and in our thinking in general.

When the 5 minutes have passed, the solution is displayed. It will typically provide the students with an "Aha" experience, where they learn that the solution is (often) outside the apparently fixed framework. If a student says, for example, "You did not tell us we could draw outside the square", the teacher can answer "No, because you didn't ask". That is precisely the point of the exercise.



28 *Simple and short tasks about constraints*

28.b. Cake for eight
The students have to imagine that they have to cut a round cake into eight equal pieces with only three cuts. The task can be supported with a drawing on the board, a picture in a slide show, or even a real cake. Have the students come up with suggestions for possible solutions, and let them draw on the board if they want to.

Solutions:
1) Use two cuts to cut the cake into four equal pieces. Use the last cut to cut across the middle of the cake, and there will be eight pieces.
2) Use two cuts to cut the cake into four equal pieces. Stack the four pieces on top of each other, and use the last cut to cut down through the four pieces, and there will then be eight pieces.

28.c. The person and the piece of wood
The students have to imagine a person holding a piece of wood in their hand. What will happen when the person lets go of this piece of wood? Most people will spontaneously say that the piece will fall to the ground. The correct answer is “It depends...”.

Solutions:
1) If the person is under water, the wood will rise to the surface.
2) If the person is in their living room, for example, the wood will fall to the floor.
3) If the person is in outer space, the wood will not move.
4) If the person is in the middle of a storm, the piece of wood will blow away, etc.

Questions for reflection after the exercise
What was difficult/easy about this exercise? Which (unconscious) constraints did you experience you? Did you find that you got stuck in one of the small tasks? Could you see why, when you later found the answer? What does it say about your thinking – and everyone else’s? How can you get better at looking for questions, not answers? How can this be transferred to your own every-day life?

29 *Simple and short tasks about inspiration*

SUBJECT TYPE	**Design, Visual art, Innovation, Architecture**
THEME	**2 Sources of inspiration**
PARTICIPANTS	**Individual, pairs, or groups**
DURATION	**5-30 minutes**
MATERIALS	**Pen and paper, digital tools (Google docs, Evernote, Pinterest), slide show for mini exercise 29.a**

Purpose

To introduce the students to simple methods of finding sources of inspiration and expanding the opportunity space (thinking divergently), using unexpected inspiration and transforming downright crazy ideas into something useful in the creative process. The students will then feel that they can actually use apparently irrelevant and unusual sources of inspiration as creative resources.

Description

29.a. What is the source of inspiration? (5 minutes)

The exercise is presented and controlled via the slide show for exercise 23 and 29.A. . Here the students have to guess which common source of inspiration is behind the images.

29. b. Oblique strategies (5-30 minutes)

This concept was developed by the musician Brian Eno and the artist Peter Schmidt in around 1975, and is actually a card game for use in creative processes. The card game is also available online via: www.oblicard.com. Each card is printed with a slightly cryptic, and therefore challenging, instruction such as "Do something boring" or "Ask your body", which the user has to interpret freely as a way to avoid creative blockages. The card game is often used in recording sessions, but can also be used at the start of a new project or during an ongoing project. The card game does contain some unfamiliar words, but the teacher can let the students play with it and take a more open approach to the instructions on the cards; there is sure to be something the students can be inspired by.

29. c. Bored button (30 minutes)

The teacher sets the students a very open creative challenge , e.g. devise a sustainability activity or create a product/concept for sharing travel experiences (see "What if ...?" exercise). The students can work independently, but the exercise works best in pairs. Each pair of students now goes to the website www.boredbutton.com, where pressing the red button takes the user to a random website. Each pair of students chooses a random number, which is then the number of times they have to press the red button. This figure should be no more than 20, so the students do not spend too much time clicking and looking at websites. Each pair of students is now sent to a random (usually silly or entertaining) website. The students must now use this website as a source of inspiration to complete their set task. If the students get stuck on the first website, they can ask permission to open a new tab, go to www.boredbutton.com and find another source of inspiration (and possibly a third, and so on). Finally, the teacher can sum up the exercise in plenum.

Questions for reflection after the exercise

Did these sources of inspiration contribute to your process? How? Why? When is it smart to bring random inspiration into your creative process? Was it easy to transfer the sources of inspiration to your creative process, or was it difficult because it was too distant from your project? Why? What does the exercise tell us about sources of inspiration?