



Development and Application of Pictographs for 40 Inventive Principles

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Playing = Learning

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How to make it easy!

Motivation / State of the Art

- ▶ Two sides of TRIZ
 - Most popular methodology for systematic problem solving
 - Too hard to learn and apply
- ▶ One of evolution trend
 - TRIZ area
 - Transition from macro to micro level
 - Design area
 - Minimalism
 - Any design or style in which the simplest and fewest elements are used to create the maximum effect
 - A design stripped down to only its essential elements
- ▶ Developed Pictographs
 - For 40 inventive principles
 - Based on minimalistic design

Two sides of TRIZ



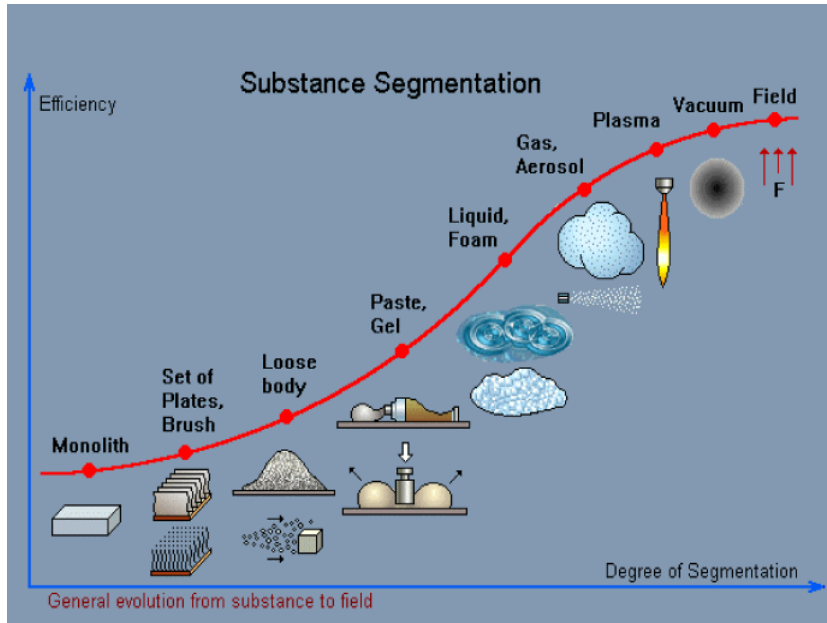
Most Popular methodology
for systematic problem solving



Too difficult
to learn and apply

One of evolution trend

* Image from Goldfire



Empty Space is Beautiful

Transition from macro
to micro level

Minimalism

Minimalistic Design



Minmalistic Design



Pictograph

Pictograph conveys its meaning through its pictorial **resemblance** to a physical object



Research Question

Altshuller's 40 Principles of TRIZ

1. Segmentation	15. Dynamics	28. Mechanics substitution
2. Taking out	16. Partial or excessive actions	29. Pneumatics and hydraulics
3. Local Quality	17. Another dimension	30. Flexible shells and thin films
4. Asymmetry	18. Mechanical vibration	31. Porous materials
5. Merging	19. Periodic action	32. Color changes
6. Universality	20. Continuity of useful action	33. Homogeneity
7. "Nested doll"	21. Skipping	34. Discarding and recovering
8. Anti-weight	22. "Blessing in disguise"	35. Parameter changes
9. Preliminary anti-action	23. Feedback	36. Phase transitions
10. Preliminary action	24. 'Intermediary'	37. Thermal expansion
11. Beforehand cushioning	25. Self-service	38. Strong oxidants
12. Equipotentiality	26. Copying	39. Inert atmosphere
13. The other way around	27. Cheap short-living	40. Composite material films
14. Spheroidality		



**Minimalistic pictographs
for 40 Inventive principles ?**

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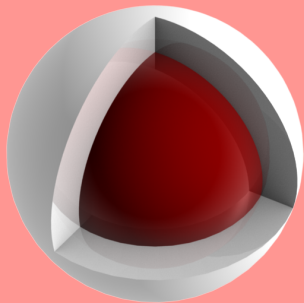
Let's draw a Picture!

Experimental

- ▶ Design rules
 - Represent the core essence of each inventive principle
 - Use very simple line and color
 - Use conceptual drawing or typical example
- ▶ Developed Pictographs
 - 40 pictographs for 40 inventive principles
 - 4 pictographs for 4 separation principles
- ▶ Developed Idea generation cards
 - Two side-cards named as 'TRIZ DOCTOR'
 - Front side
 - Name of the principle, associated pictograph and related question
 - Back side
 - Detail inscription of the principle
 - 10 typical examples derived from students' practices
 - Applied for a patent

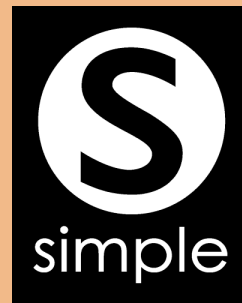
Define Design rules

Core



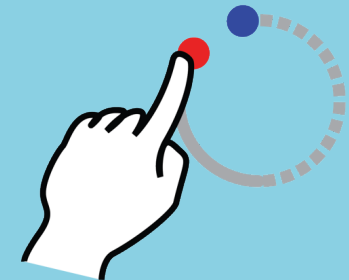
**Represent
the core
essence only**

Simple



**Use
simple line &
color**

Shape



**Shape the
concept or
typical example**

3

Now, we can Enjoy TRIZ

Some reasons of playing

- to learn
- to create
- to feel challenged
- to pass time
- to calm and focus ourselves
- as spectators watching others
- competitively to win
- cooperatively
- for the fun of it
- for the joy of it

We can change
Studying
to Playing
by ourselves.

That's a good
Reason to enjoy.

게임이름 : 모두의 TRIZ

게임 방법 : 1. 한묶음의 카드를 6장씩
4뿔 갖는다.

* 추가내용 *
한가지 주제에 대한
예시를 적용시켜 카드를
내는 방식으로 한다.

2. 자기차례가 왔을때
카드를 내면서 설명 & 예시
만르면 PASS

3. 주어진 턴 횟수만큼 지난후
손에 가진 카드가 가장 적은
사람이 승!! Win

4. 게임중 카드 모두 소진시
TRIZ를 외치며
일어선다.

* 장점 *

- 창의력 증진
- 순발력. 재치 향상.
- 간단하고 재미있는

게임 rule.

We're playing



We're still hungry

· 게임 이름 : TRIZ memories.

· 게임 진행 방법 (팀전시 만장일치로 해야 정답 인정)

1. 게임카드 범위를 정한다 (예: 1~10까지)

2. 출제자가 카드 뒷면의 예시를 말한다.

3. 참가자는 그에 해당하는 발명_{원리}을 맞춘다

· 게임 4. 맞출시 카드를 버리고 못 맞출시 카드를 갖고 온다

5. 게임 끝날시 카드를 적게 가진 사람이 이긴다.

· 게임의 장점

1. 예시와 발명원리를 동시에 알 수 있다.

2. 흥미유발

3. 두뇌개발

We're playing



Results and Discussion

- ▶ **Less is more**
 - Utilized pictographs in several TRIZ beginner course
 - Very helpful to understand and remember the core concept of inventive principles
 - Those are not for reading but for seeing
- ▶ **Playing with 'TRIZ DOCTOR' cards**
 - Study with fun and ease
 - Creative game design by students
 - Studying and playing at the same time
- ▶ **Further plan**
 - Develop Multi-language and multi-age version

Let's enjoy TRIZ!