

National Changhua University of Education

2011
Creative Engineering Design

2011/12/23

Prepared by Kerwin Wang
Department of Mechatronics Engineering



Creative Thinkers



Design Philosophy



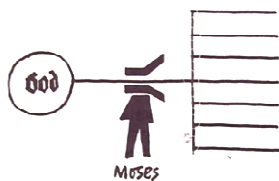
Funny Inventions



Useful Inventions



Moses



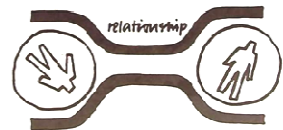
Moses acted as the loudspeaker who broadcast God's will as tight set of law that established a people and religion.



http://tw.wrs.yahoo.com/_ylt=A8tUxwnLV1dHYwYBAQlr1gt./SIG=12fbvjui/EXP=1196992843/**http%3A//tw.knowledge.yahoo.com/question/%3Fqid=1405123020680



Confucius



Confucius put all the emphasis on the relation itself. The Christian put more weight on encourage a man or woman to be right within himself/herself



Plato



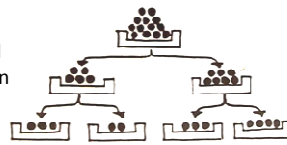
The ordinary man sits in his limited cave and sees only the shadow of reality. Plato insisted that the truth existed as true forms below the surface appearance of things. (Philosopher like to see the truth itself.)



Aristotle



Aristotle classified and categorized concepts in order to extract their full meaning and form their relationship to each other.



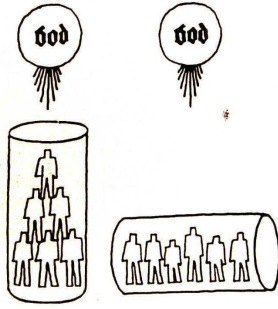
after



He offered the kingdom of God in which all men were equal.

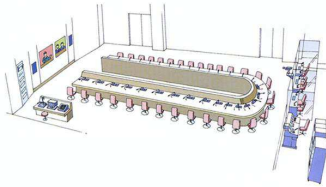


Jesus



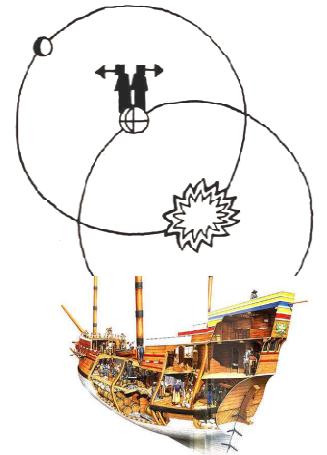
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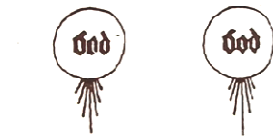
Copernicus

Copernicus set off the revolution in thinking that was to follow.



Luther

Man could communicate directly and on personal level with God without the intervention of Church.



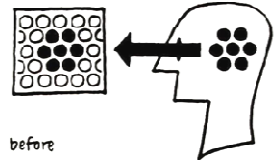
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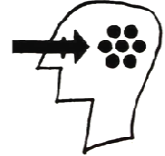
Bacon

The truth only came from careful observation.



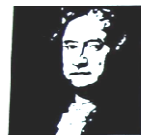
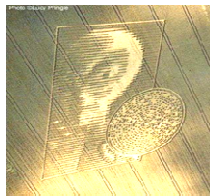
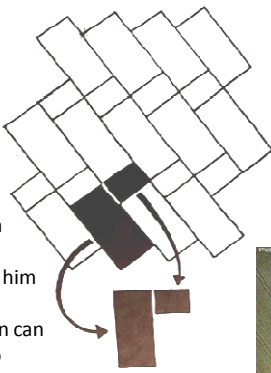
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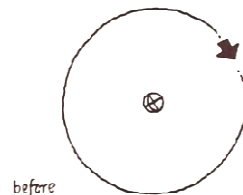
Descartes

Descartes' success in inventing analytical geometry convinced him that even the most complicated situation can be broken down into simple parts that are combined in a special way.

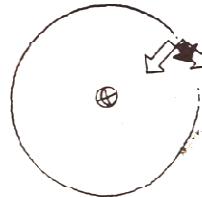


Newton

Newton explained many mysteries of the natural in a scientific way.



before



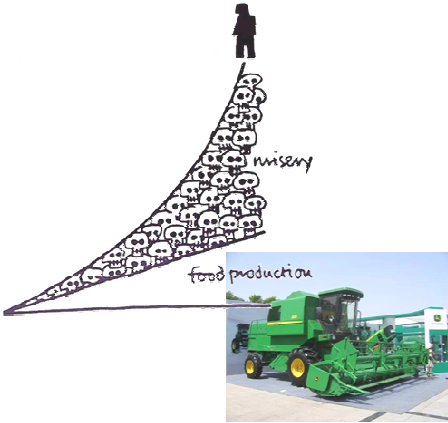
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Malthus

He saw nothing in nature which would halt the geometric growth of population.



Clausewitz

The father of management science, he was interested in action not in essence.



before



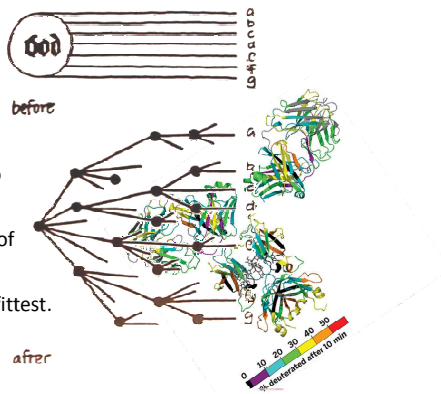
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Darwin

Using Evolution to explain the

- 1. Differentiation of species.
- 2. Survival of the fittest.



before

after

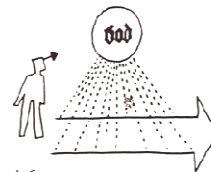


Nietzsche

Supermen theory

Nietzsche restore man's moral fibre.

God was dead.



before

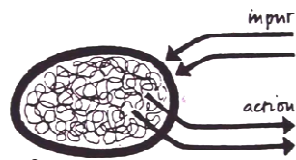
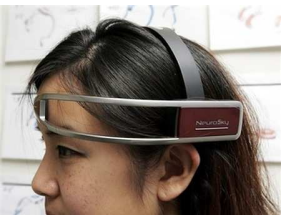


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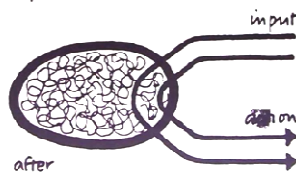


Pavlov

Human's behavior could be controlled and predicted.



before

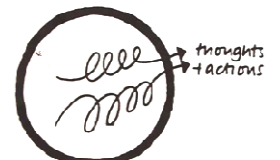


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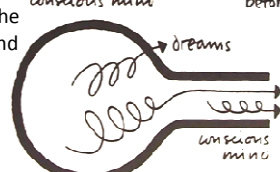
Freud

The conflicts of the subconscious mind could be seen to explain much of human behavior.



conscious mind

before



unconscious mind

after



Sleep Learning

自我暗示有著驚人的力量

睡眠週期九十分鐘

睡眠學習睡前暗示

REFERENCES

1. Weidenfeld and Nicolson, "The Greatest thinkers"
2. Beitz W. and Pahl G., Engineering Design: A Systematic Approach, The Design Council London
3. <http://en.wikipedia.org/wiki/>

Hi Kerwin,

I'd be honored if you would show my images to your students. My websites are:

<http://www.pbase.com/dsouz/>
<http://www.engagingimages.ca/welcome.html>

Thanks and all the best!

..Lew D'Souza..

Kerwin Wang wrote:

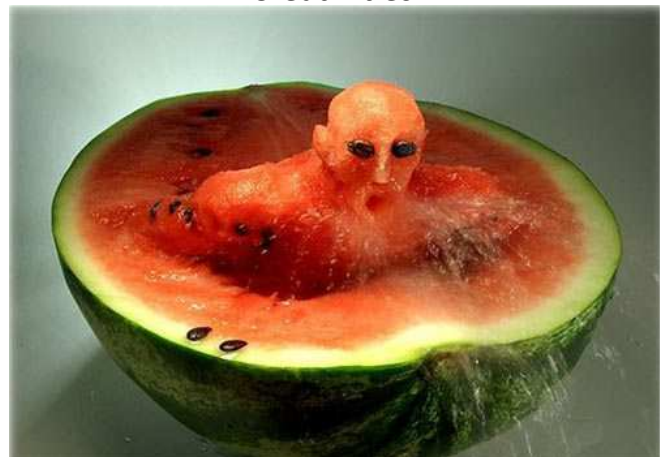
Dear Dsouzl,
 May I show your creative images to my students in the "Creative Engineering Design" Class?
 I think these pictures will give them very good inspiration.
 All the Best!

Kerwin Wang, Assistant Professor
 Department of Mechatronics Engineering
 National Changhua University of Education
 1, Jin De Road,
 Changhua 50007, Taiwan

Creativities



Creativities



Great Images



From http://www.pbase.com/dsouz/fun_stuff

Great Images



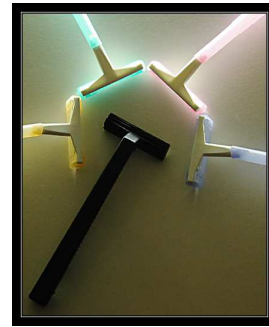
From http://www.pbase.com/dsouz/fun_stuff

Great Images



From http://www.pbase.com/dsouzl/fun_stuff

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From http://www.pbase.com/dsouzl/fun_stuff

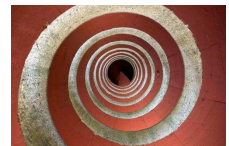
OK!!!

Let's take a break

and then

move to the

DESIGN



What is Engineering Design?

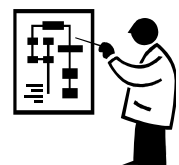
- Systematic thinking
- A process of converting information that characterizes the needs and requirements for a product into knowledge about a product.
- It is a data based decision making process.
- It is an Open System

Let's play an example!!



Engineering Design

- Problem Identification
- Creative Process (stress can enhance creative process)
- Limitations and Barriers to Creative Thought
- Tools Available to Designers



Funny inventions



Funny Design in Japan



Funny Japanese Inventions



Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions



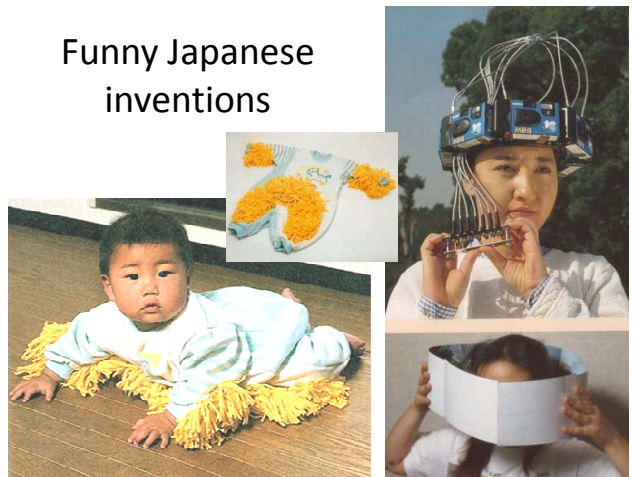
Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions



Funny Japanese inventions

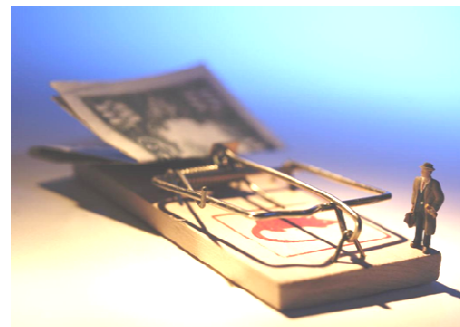


Limitations and Barriers

- Intellectual Barriers
- Emotional Barriers
- Social and Cultural Barriers
- Material Properties
- Technology Barriers
- Dilemma



Money Traps



Tools Available to Designers

- Continuous quality improvement (cascading chart)
- Planning tool (QFD)
- Time management tools (active network, master schedule, Gantt (PEI) chart,...)
- Ideation tools (brainstorming, mind-mapping, visual thinking, combing ideas, morphological matrix)
- Evaluation and analysis tool (knowledge box, evaluation table, on-conscious competence, ramification learning plan, up-to-date knowledge)

Tools Available to Designers

SIX THINKING HATS

White => An objective look at data and information

Red => Intuition

Black => Logical negative (judgment, caution)

Yellow => Logical positive (feasibility)

Green => New idea & creative thinking

Blue => Control of thinking process



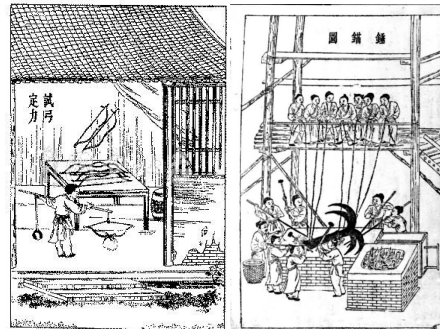
The way of thinking

- Lateral thinking
- Vertical thinking
- Critical thinking
- Objective oriented thinking

Be a Good System Designer

- A good system designer is like a conductor of an orchestra who get right materials and design parameters to play right function at the right place.

Steps In Engineering Problem Solving



Chinese Technology in the Seventeenth Century: T'ien-kung K'ai-wu, Yingxing Song
天工開物, '宋應星' 1637

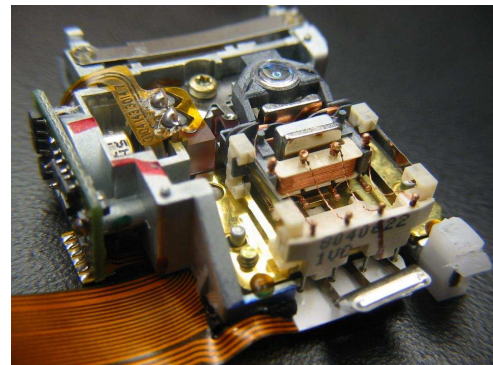


A Real Engineering Design Example

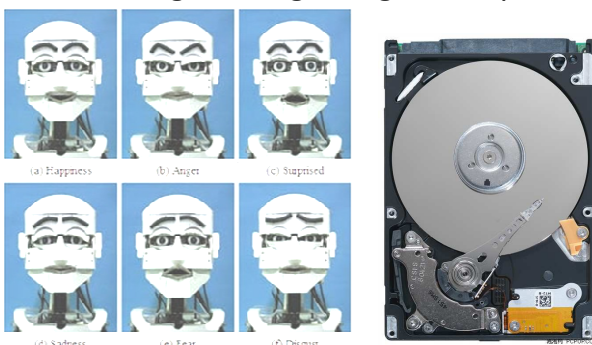


From :www.nissan.com

A Real Engineering Design Example



Real Engineering Design Examples



<http://consultaglobal.wordpress.com/2008/02/16/innovation-and-the-rationale-behind-emotional-design/>

Robot Philosophy

KEYWORD FOR SEARCH

- [All is full of love](#)
- [Puppy Vs. Robot! Epic Battle For Territorial Domination!](#)
- [Eva the female robot](#)
- [Doll Face](#)



Funny Invention with Great Market



1990 中澤信子 初恋ダイエット スリッパ 初恋瘦身拖鞋



Green + Orange Technologies in the Future



大友克洋 作品

Great Inventions



The End is the Beginning



Famous illusion M.C. Escher - Ascending and Descending