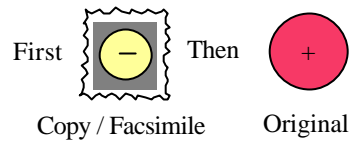


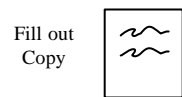
Copy / Facsimile



- Can the **essential part** of one of the conflicting properties be **copied** into another object?
- First use the copy and then the original or vice versa

Photographs
Movies
Paint Coverings
Molds
Time lapse photos
Impressions

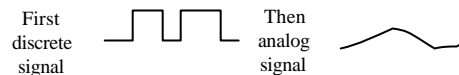
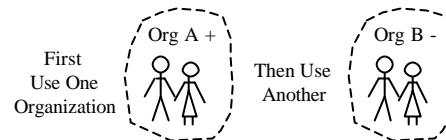
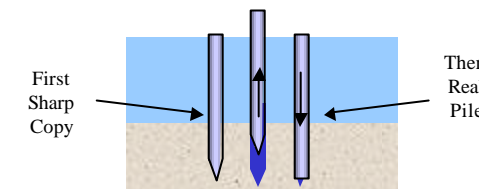
Silhouettes
Castings
Resists
Projections
Computer Model
Dummies



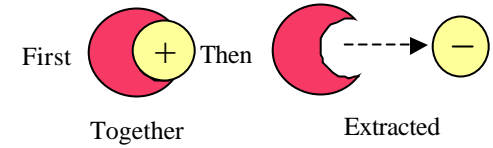
Two Objects



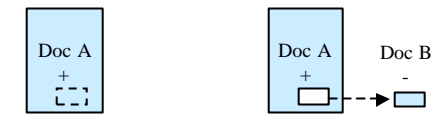
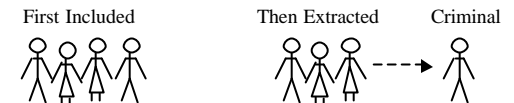
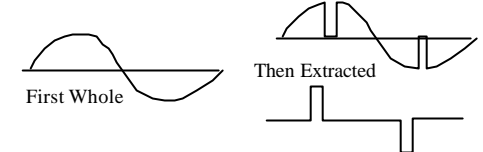
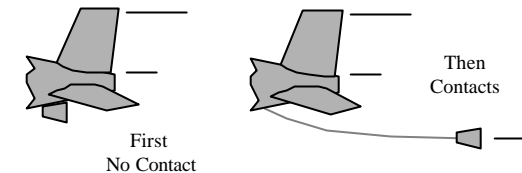
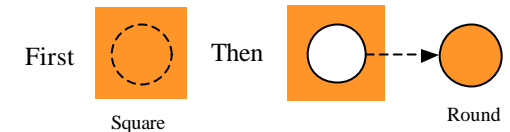
- **Use two separate objects.** The objects are the same in most respects except that they have conflicting properties
- Use one and then the other



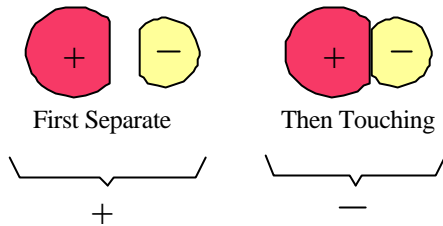
Extraction



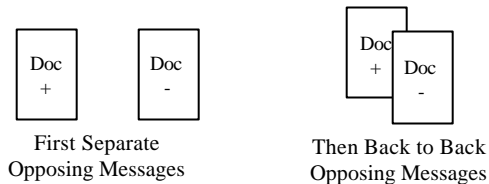
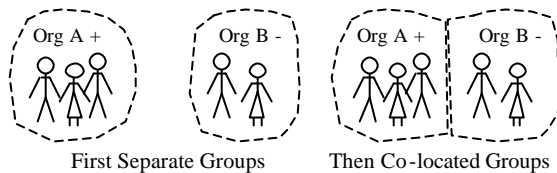
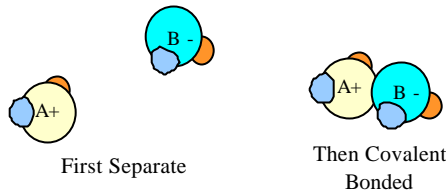
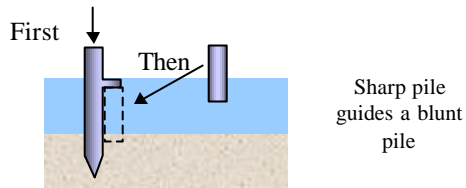
- Part of the original element which requires both properties is made easily removable and as small as possible.
- In the first instance the entire assembly remains whole.
- Later, the element is extracted and separated from the rest.



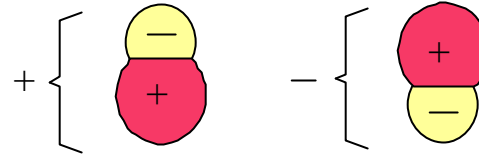
Touching / Separating



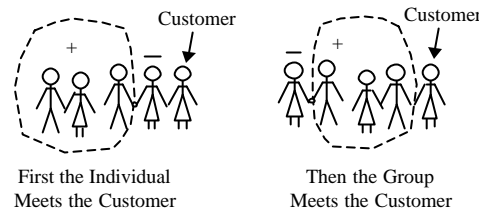
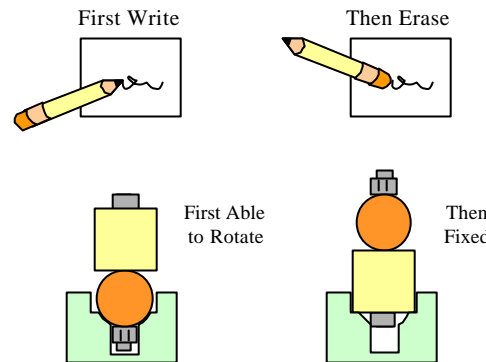
- **Duplicate or segment** the element and give each opposing values. One element guides the other (make use of existing fields)
- When touching the combination has one property. When separated, they have the conflicting property



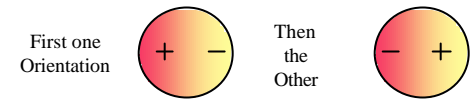
Reorienting Attachments



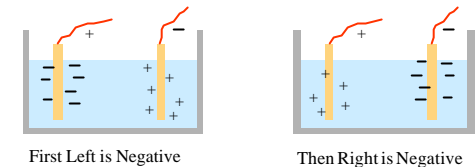
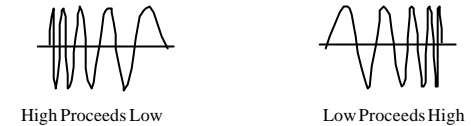
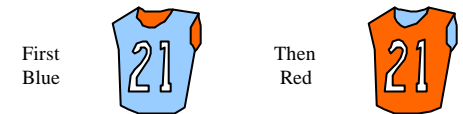
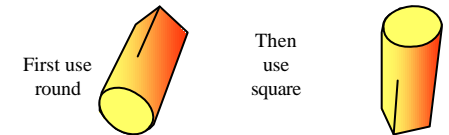
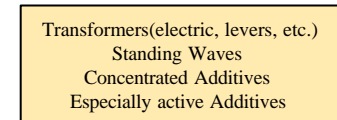
- Two objects are attached, each having conflicting properties
- In orientation, the whole has the property of one element. In another orientation the whole has the conflicting property



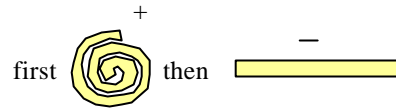
Non-Uniform



- **A single element** has both conflicting properties. The element is not uniform. If possible, make a smooth transition between conflicting properties
- First **orient one way** for one property and then **orient another way** for the opposing property

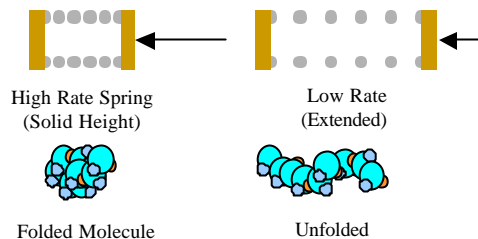
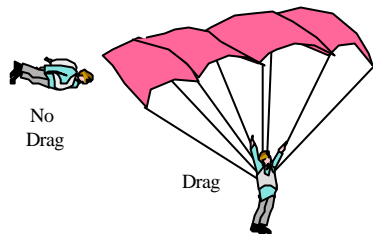
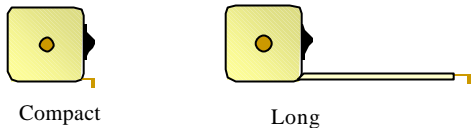
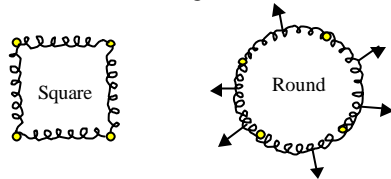


Unrolling--Stretching

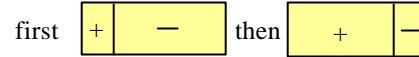


- Fabrics
- Springs
- Molecules which change shape

- Multiply elements and form them for merging and moving about.
- Consider Nesting



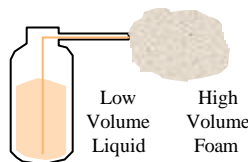
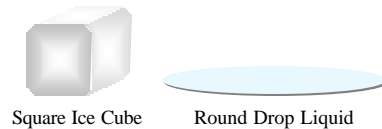
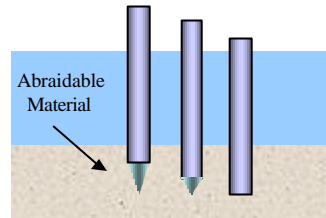
Transformable States



- Consider the **list** of Transformable substances
- Can **both** conflicting properties be present at all times, but only one is in abundance at a time?
- Operate the substances near the **critical point** so that small inputs create strong outputs.

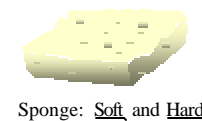
- Solid to Liquid
- Solid to gas
- Gas to liquid
- Combustible materials
- Fissable
- Glue
- Explosive
- Exo-Endothermic

- Soluble or dissolvable materials
- Settable liquids --(increase of volume)
- Easily breakable or abraidable
- Polymerizing or de-polymerizing
- Mixture decomposition--Electrolysis
- Disassociation- recombination
- Shape Memory Materials
- Magnetic materials using Curie Effect

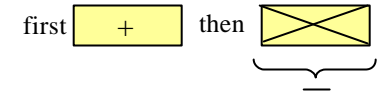


Chopsticks:
One Piece
then Two

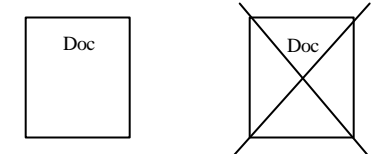
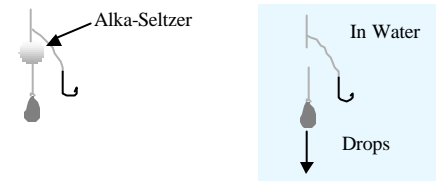
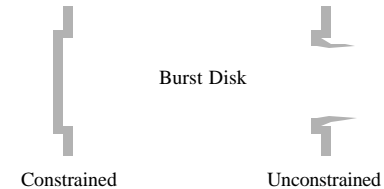
Breakable
Section



Discarding



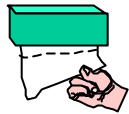
- The discarded object should be inexpensive and harmless
- Can an unwanted conflicting property be discarded with an object?
- Change of State (Solution, phase, breakable, chemical stage, heat effect, phase accompanying effects.
 - Self elimination or "disappears"
 - Chemical decomposition
 - Physical Transition to new state



Preliminary Action

+ way (partially) then - way (fully)

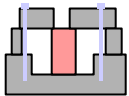
- Are the conflicting properties **the way** that the modification is performed?
- Can the modification be performed one way **partially** and then finished the opposite way? (Cut slowly and rapidly)
- If the **reliability** of an element must be high and low, can another element be placed to take over in the event of a failure? (Previously Placed Cushion).



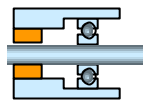
PERFORM PARTIALLY: The paper must be cut for rapid removal and not cut so as to pull out the next towel



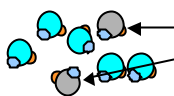
PRE-INSERT TOOL OR PART OF A TOOL: Saw blade is embedded in the cast during forming to facilitate later removal. The cast is cut rapidly and cut slowly



RAPID SETUP (LEAN): Parts are prepared in jigs for rapid insertion into a process while the previous piece is being processed. The piece is being machined and not machined



PREVIOUSLY PLACED CUSHION: A part is brought into position to take over a function in the event that another part fails. A bushing takes over for a failed bearing. The Bearing is Unreliable and Reliable

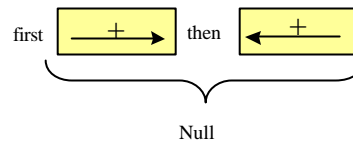


PRE-INSERT "TOOL OR PART OF TOOL": Inactive molecules await later activation or sensing. For instance, iridescent molecules are visible and not visible

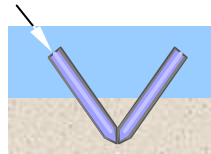


PERFORM PARTIALLY: Training-Work is performed in evening and performed during the day. (Part of the work is evening training to prepare for the days work)

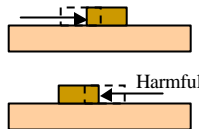
Preliminary Counter Action



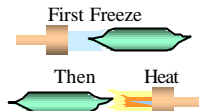
- Counter an action by performing the opposite action in advance.
- Does the feature have direction or can it be changed in some way to have direction?
- Orient elements to nullify each other in the future
- Consider previous placement of a **tool**
- VIBRATION CANCELLATION



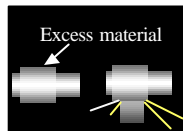
BUTTING OR TENSIONING: One is brought into place (Sharp) and then a duplicate is brought into place that cancels the undesirable property of both (Making both Blunt) Consider using a transmission between elements.



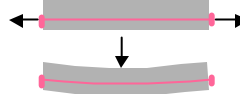
Move the object in advance in the opposite direction of a later harmful movement. The harmful movement places the object where you wanted it anyway. Thus the object is Moved and Unmoved



An ampoule filled with heat sensitive medicine must be heat-sealed. The heat will damage the medicine. The ampoule is first cooled with liquid nitrogen and then the end is heat sealed.



Extra material is added in advance for an anticipated wearing action in the future. Thus, the shaft becomes worn and unworn



Concrete is pre-stressed (in compression) so that later loads allow the concrete to remain in compression. (Concrete does not sustain high tension loads) The concrete has high stress and low stress

Excessive Action

Too Much then Perfect ~~X~~

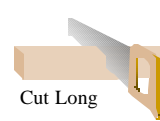
- Perform the action excessively and then remove the excess



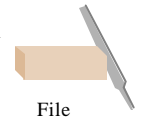
Paint all



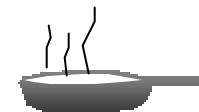
Remove Masking



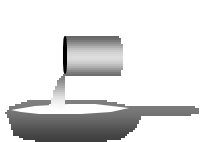
Cut Long



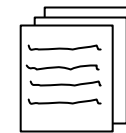
File



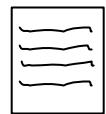
Gravy comes thick



Thinned for consumption



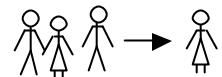
Excessive length for uninterrupted writing



Edited to be precise

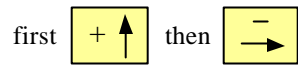


Group excessively large to guarantee enough participants

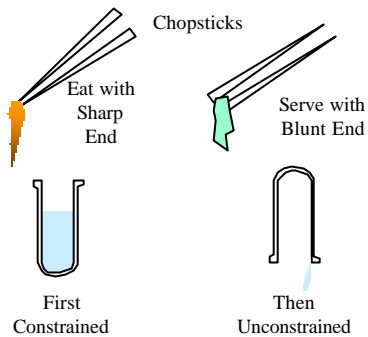
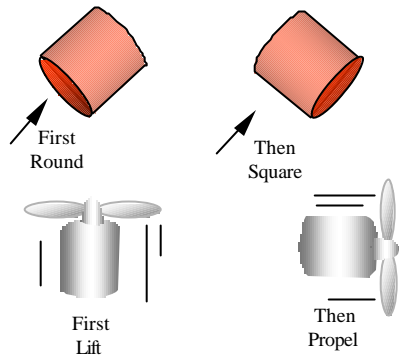
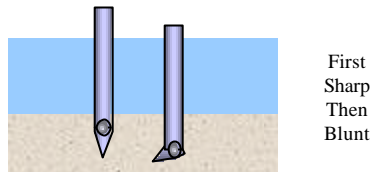


Those not required can leave

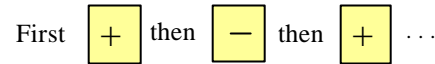
Changing Direction



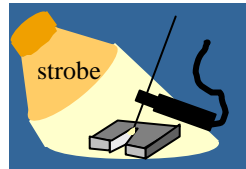
- Can the property be oriented in one direction?
- Change the orientation in time
- Orient one way for function 1
- Orient 2nd way for function 2



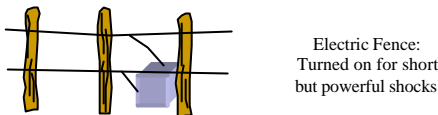
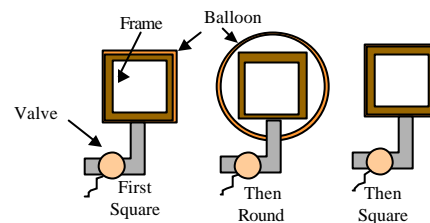
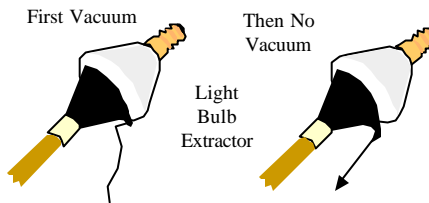
Switching Fields



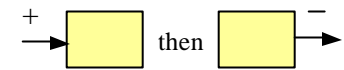
- Add a field or Identify Existing Fields.
- Switch the Field on and Off.



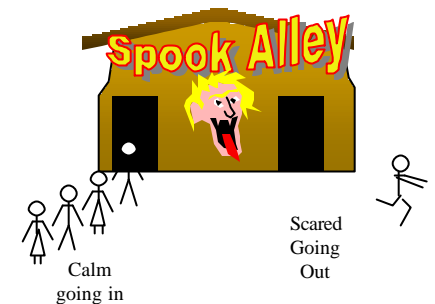
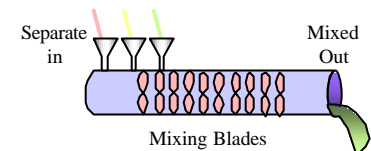
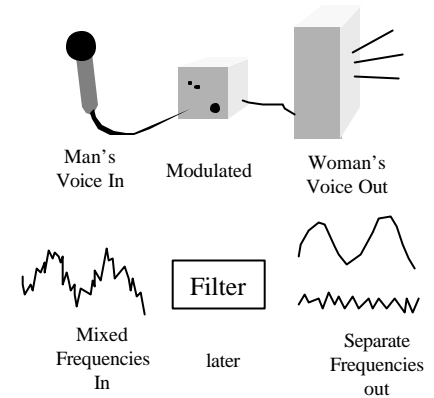
Arc Welding:
Strobe on to see melt. Strobe off to see the arc.



Input / Output

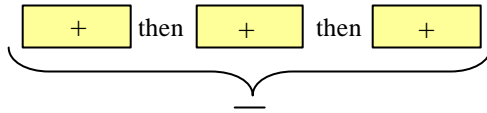


- An object has something with one property coming in and then later, the opposite property exiting.

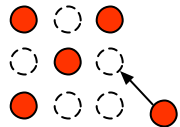


Separate Gradually -- Can opposing property be built up over time?

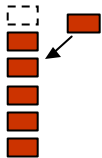
Separate Use



- The variable or action comes into use, one at a time. Over the course of time the addition of elements with one property create the conflicting property of the whole
- PREVIOUSLY PLACED CUSHION:
Unreliable + Unreliable = Reliable



Gradually becomes a square from separated round pieces



Gradually becomes a long structure from separated short pieces

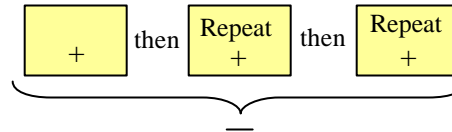


CHEAP SHORT LIFE: Many cheap disposable plates used over time have same effect as one durable plate

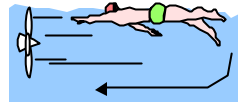


Many separate small explosions can have same effect as one large explosion

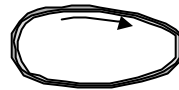
Repeated Use



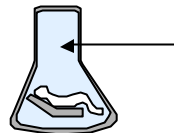
A variable is used repeatedly, perhaps after being recovered. **Usually involves a repeated or circular process.**



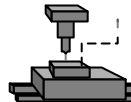
REUSE: Little water used over and over = much water



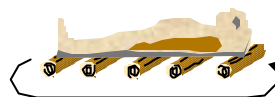
SPHEROIDALITY: Short belt length used over and over becomes infinite length



REGENERATION: A little air regenerated becomes a lot of air

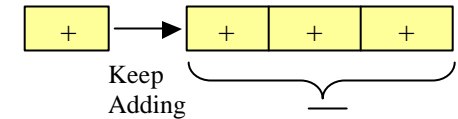


UNINTERRUPTED USEFUL EFFECT: One machine in continuous use = a lot of machines (eliminate dummy runs)



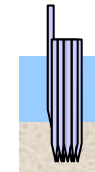
REUSE: few logs used over and over = many logs

Gradually Merged

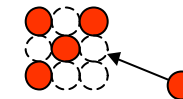


Multiply or Segment the object and merge one at a time. Arrange the individual parts so that the merged whole has the conflicting property of the individual parts

- MERGE AT MICRO LEVEL
- PARTIAL ACTION :Partial Action + Partial Action + Partial Action +Partial Action = Whole Action



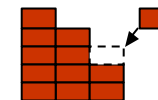
Blunt pile is created from the merging of many sharp piles



Gradually becomes a square from round pieces



STORAGE: Gradually storing small amounts of water = lots of water

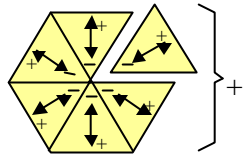


Gradually becomes a large structure from merging of many small pieces

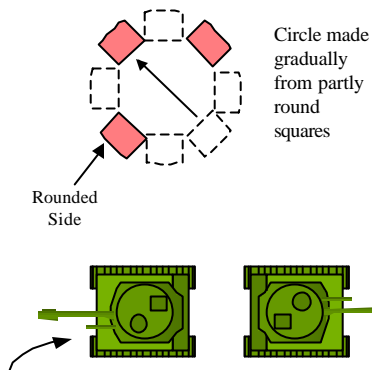


STORAGE: Gradually storing small amounts of electricity = lots of electricity (Solar Panel)

Gradually Hidden / Exposed

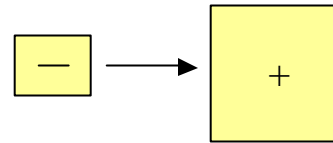


- Applies to multiple elements (same, similar or dissimilar) which have an undesirable property
- Does any part of the object have the desired Property, even in the slightest degree?
- Gradually merge elements and orient them in such a way that the undesirable conflicting property is hidden, (at least functionally).

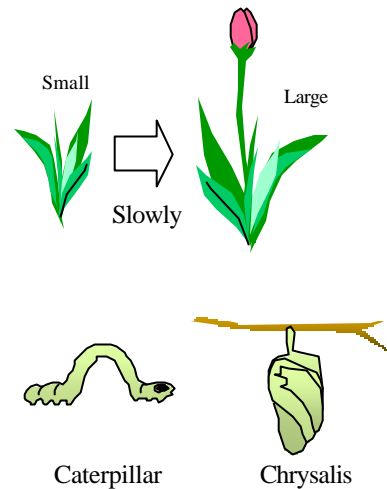


Each tank is protected from the front and vulnerable from the rear. Thus, newly arriving tanks protect each other.

Maturing / Proliferation



- Over the course of time objects grow (cells or elements divide and change. Some cells or elements die off).
- At one point in time they have one property. That property slowly changes over time

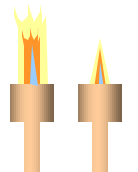
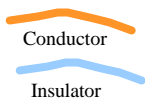
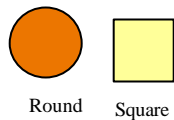


Separate in Space -- Where must the properties exist at the same moment in time?

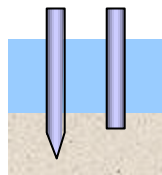
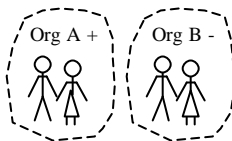
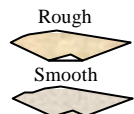
Two Objects



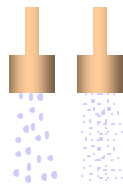
- **Two** objects exist with conflicting properties.
- Can start by duplicating the object in question and then giving both the conflicting properties.



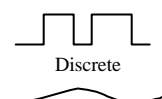
High Flame
Low Flame



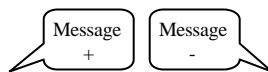
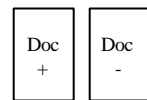
Sharp & Blunt



Coarse Spray
Fine Spray



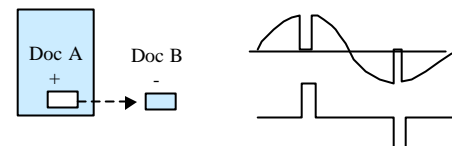
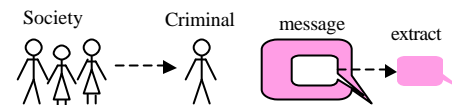
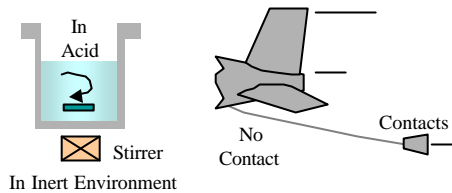
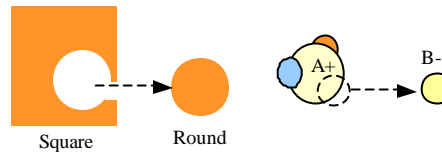
Discrete
Continuous



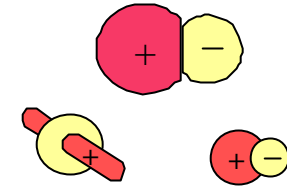
Extraction



- Separate out the **part** of the element that causes or receives the most harm. Make it as small as possible.
- Separate Parts may still interact through a field. Identify the Field

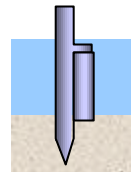
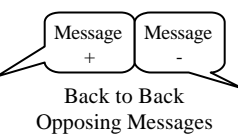
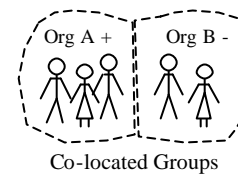
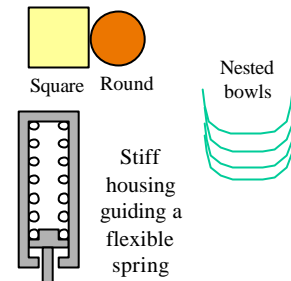


Guided / Nesting / Through

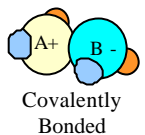


Through Nesting

- **Duplicate or segment** the element.
- One element goes through the other element
- One element is guided or positioned by the other element.
- One element nestles into the other



Sharp pile
guiding a
blunt pile

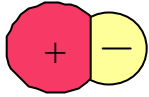


Covalently
Bonded



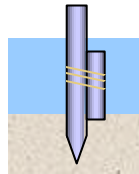
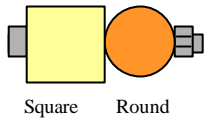
Conductive
brushes guided
by insulating
commutation
sectors

Attached



- One element has the desired property. It is **attached to** another element, having the conflicting property

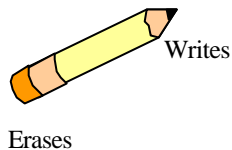
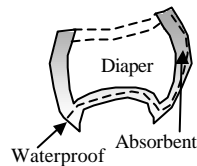
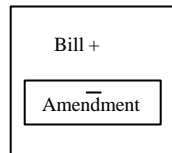
Inert Carriers
Dual States-same material
Dual Phase Substances
Thin Films
Paint



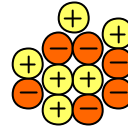
Blunt & Sharp



Conflicting Messages
are Attached

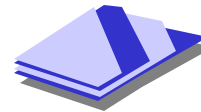


Mixture

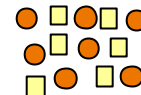
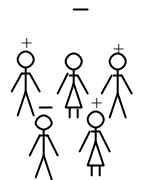


- A mixture is made of elements having conflicting properties
- Consider finer and finer scales down to sub-atomic particles

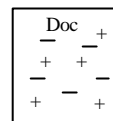
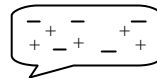
Multi Fiber Fabrics
Multi Property Laminates



Laminates

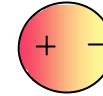


Square & Round



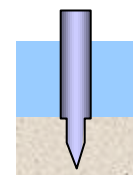
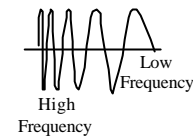
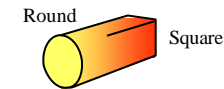
Two fiber types

Non-Uniform

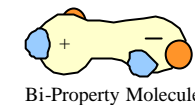


- **A single element** has both conflicting properties. (It is not uniform)
- Consider a smooth transition between conflicting properties
- **INPUT / OUTPUT**--The input has one property, the output the other

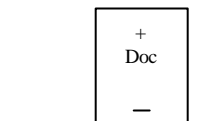
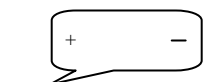
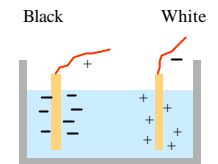
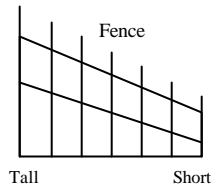
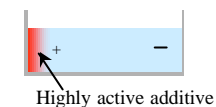
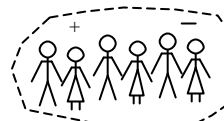
Transformers(electric, levers, etc.)
Standing Waves
Concentrated Additives
Especially active Additives



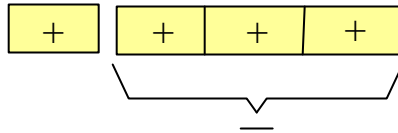
Blunt & Sharp



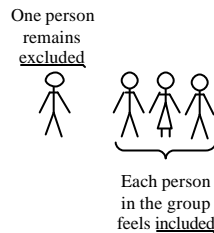
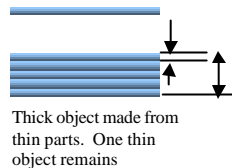
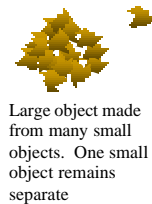
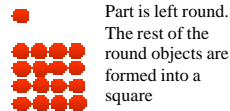
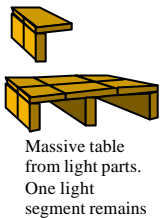
Bi-Property Molecule



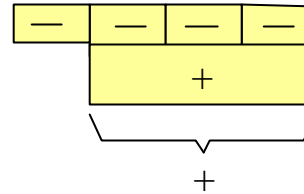
Part is Merged



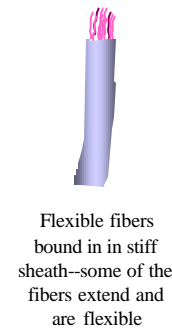
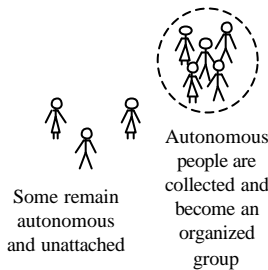
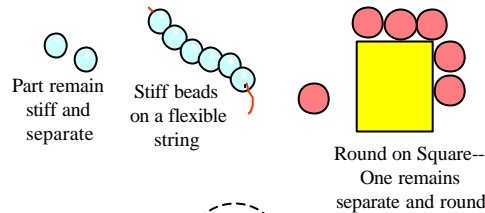
- Multiply or segment the elements
- **Merge** some of the multiplied or segmented elements to give them the conflicting property
- The parts not merged have the conflicting property of the merged parts



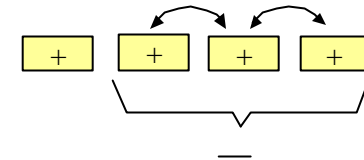
Part Carried



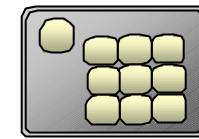
- Multiply or segment the elements
- Several objects with one property are attached to another object having the conflicting property.
- The parts without the carrier have the conflicting properties of the parts with the carrier



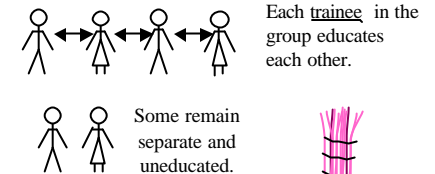
Part Interacts



- Multiply or segment parts
- Make some of the parts interact thus giving these parts the conflicting property
- Interact:
 - Parts Adhere
 - Parts Nestle into each other
 - Parts Shaped to Inter-link
 - Parts linked by transmission elements
 - Parts interact by field (Consult table)
 - Parts reshape the existing parts



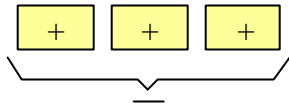
Several rolls stick to each other in a square group. One remains separate and round.



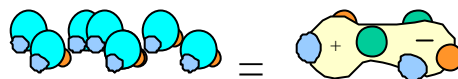
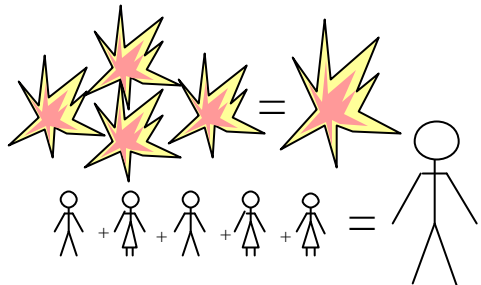
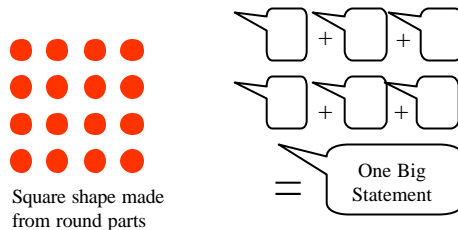
Flexible fibers partially bound in stiff bundle--some of the fibers extend and are flexible

Separate by Scale -- Can elements be segmented or multiplied ?

Multiplication



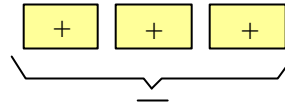
- **Multiply** the object and **separate** in space. Arrange so that the multiplied parts have the conflicting properties of the whole
- Scale down multiplied versions if necessary



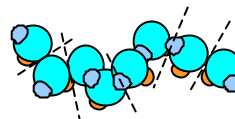
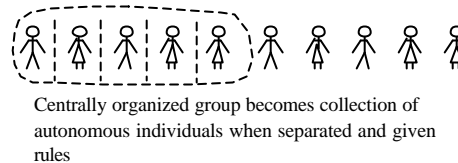
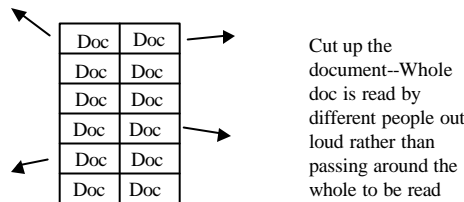
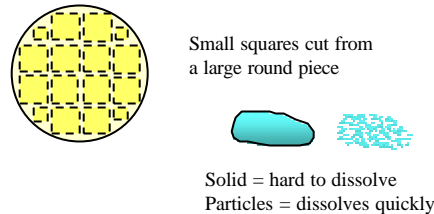
Many sulfuric acid molecules

Ion exchange membrane molecule

Segmentation

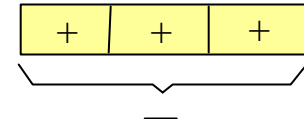


- **Segment** an object having one property into objects with the conflicting property

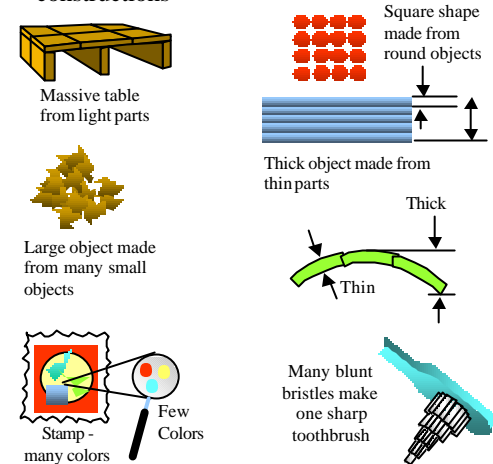


Molecules after cleaving have opposite property of whole molecule

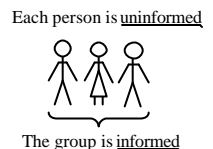
Merging



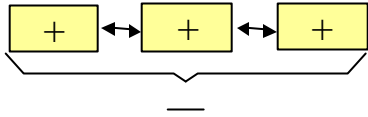
- **Merge** Multiplied or Segmented parts. The merged whole has the conflicting property of the individual parts
- **POROUS MATERIALS** (Many Small volumes = large volume)
- **EXCESSIVE ACTION** (Uncontrolled + Uncontrolled = Controlled)
- **BLESSING IN DISGUISE** multiply a harmful variable and then arrange and merge to make useful
- **FRACTALS** Consider Fractal constructions



Many inflexible coils = flexible



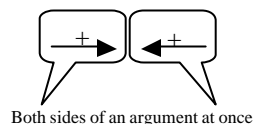
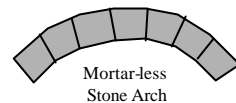
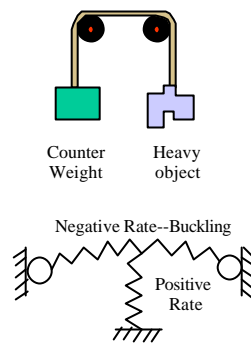
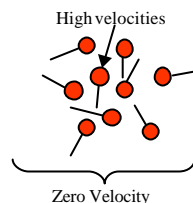
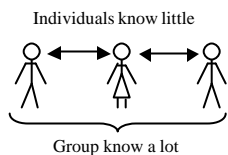
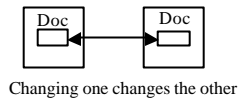
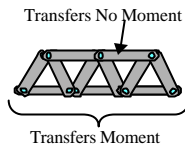
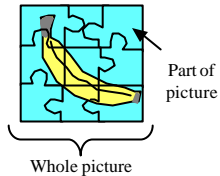
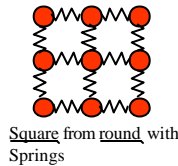
Interacting



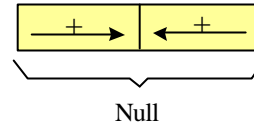
- **Multiply or Segment** the main object
- The parts and the whole have conflicting properties. The the parts interact (control each other)

- Parts Adhere
- Parts Nestle into each other
- Parts Shaped to Inter-link
- Parts linked by transmission elements
- Parts interact by field (Consult table)

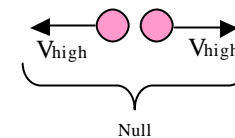
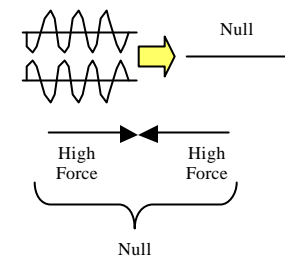
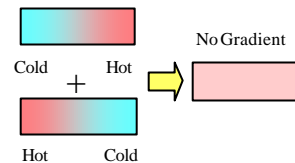
- **BLESSING IN DISGUISE** multiply a harmful variable and then arrange and interact to make useful



Countering

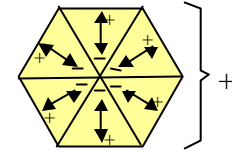


- Two strong actions give a null action. Typically used with fields and movements
- Does the variable have direction or can it be changed in some way to have direction?
- Draw the field gradients or vectors. Can elements be oriented such that the fields overlap, counter or otherwise nullify each other? (COUNTER WEIGHT) Can the elements **Butt or Tension** each other? (Consider a **transmission** elements).
- **NEGATIVE + POSITIVE SPRING RATE**
- **NEGATIVE RATE CHANGE OF LEVER ARM**

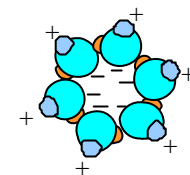
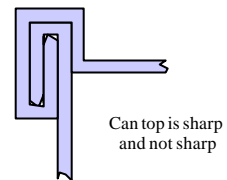
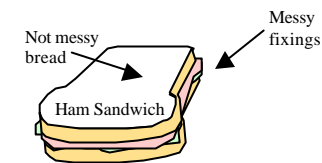
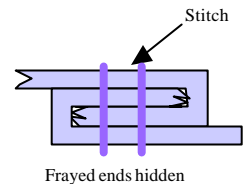
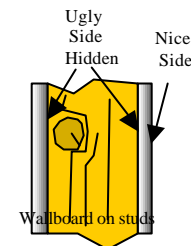
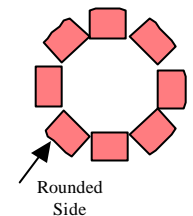
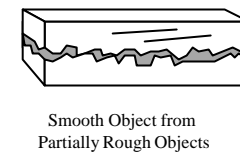


Organizations strengths pitted against itself

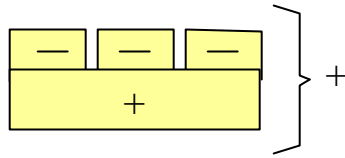
Hiding



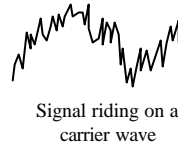
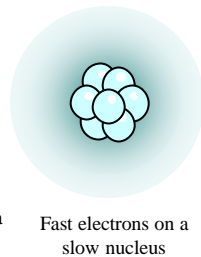
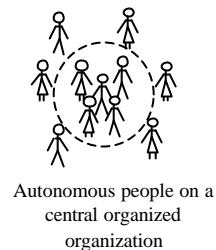
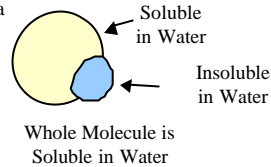
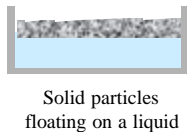
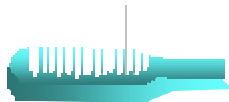
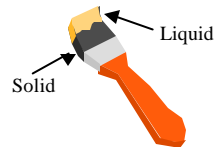
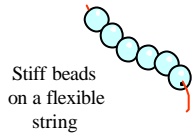
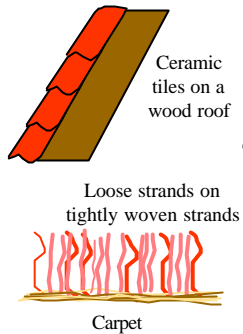
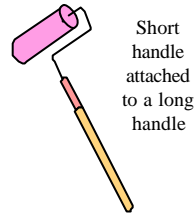
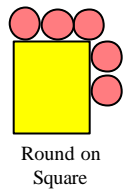
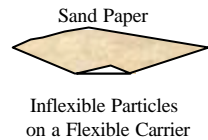
- Multiple elements are involved. Each element has an undesirable feature.
- Does any part of the object have the **desired feature**, even in the slightest degree?
- Merge **2 or more** elements and orient them in such a way that the undesirable feature is **hidden**, (at least functionally).



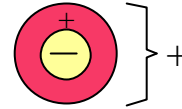
Carrier



- One or more objects with one property are attached to another object having the conflicting property.
- The whole takes on the property of the second object
- COMPOSITE MATERIALS

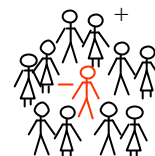
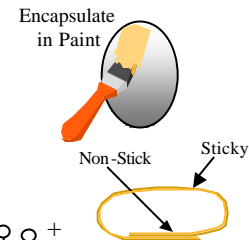
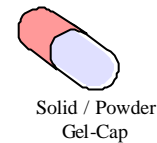
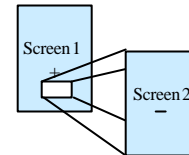
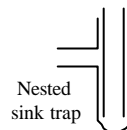


Nesting

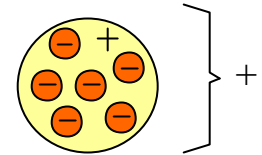


- Separate into two elements with opposing properties. Nest the elements
- The whole has the opposite property of the nested element

Dual Phases - Change of State
Foams
Porous materials
Paint
Inert Environments

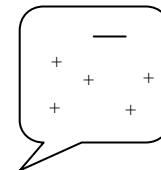
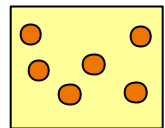
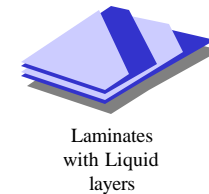


Mixture



- Elements having one property are mixed with a medium having the conflicting property
- The whole generally has one of the properties of one constituent for one situation and another for another situation
- Consider finer and finer scales down to sub-atomic particles

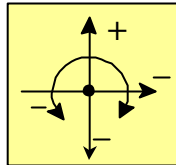
Fabrics and Matrix
Mixtures of Different Molecules
Gels (Liquids + Solids)
Pastes (Liquids + Solids)
Foams (solid or liquid)
Capillary Structures (Solid + Liquid)
Components of Solids or Liquid



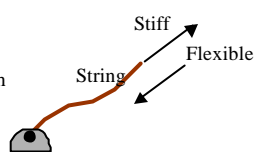
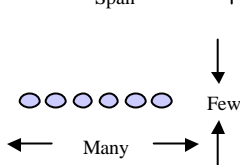
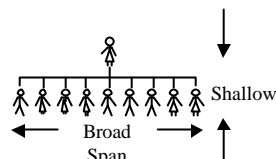
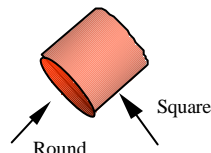
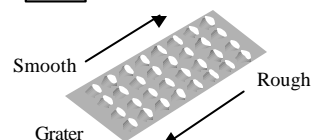
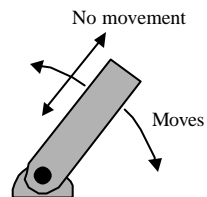
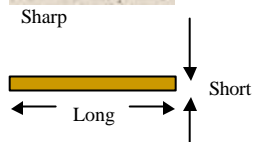
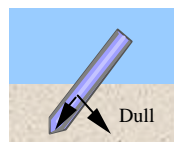
Solid + Liquid = Gel

Separate by Direction Can there be opposing properties in different dimensions?

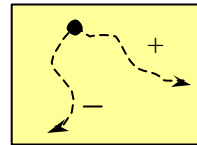
Direction



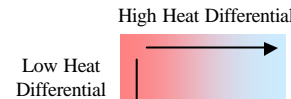
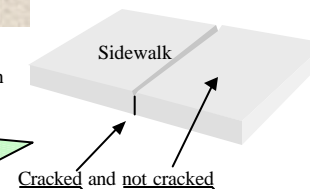
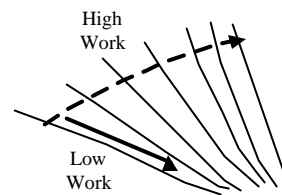
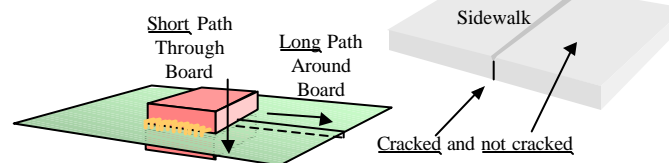
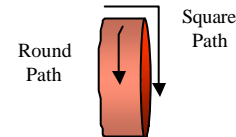
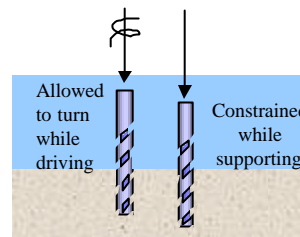
- Does the object have a desirable property in one direction and not in the other? Can it be made to?
- Identify the two functions that it must perform. Orient the object so that it performs one function in one direction and the other in the other direction



Path

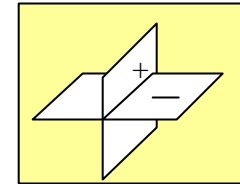


- Can the object operate along a path with two end points?
- Can the feature be envisioned as a path with two end points?
- Consider paths in other dimensions
- **EQUIPOTENTIALITY:** In a potential field, limit position changes against the potential gradient. For example, eliminate the need to raise or lower objects against gravity. Moves (+) rotationally but No Movement (-) up or down.

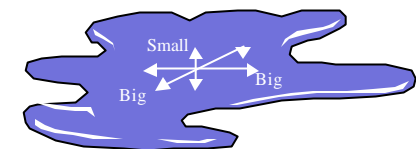


Potential Lines

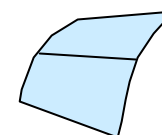
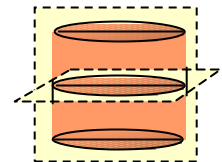
Sectioning



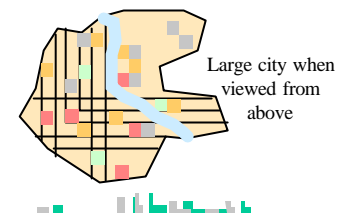
- Does the object already have the desirable property in one dimension (plane, object intersection) and the conflicting one in another?
- Can the object be formed to be this way?
- For example, a city is large in only one plane
- **Consider moving to a new dimension**



Square in one section-Round in another

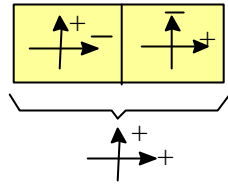


Line is Straight While Surface is Curved

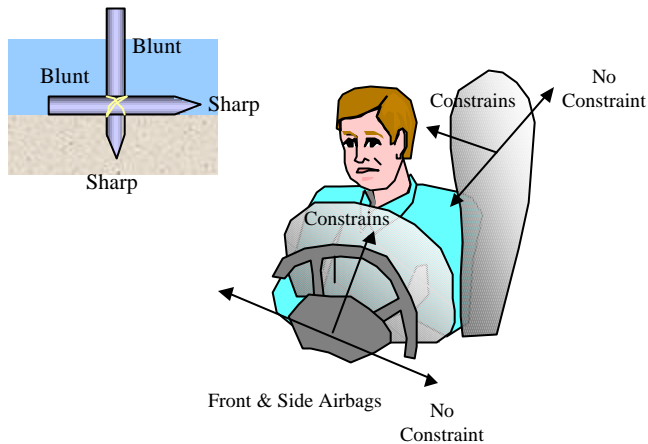


Small city area when viewed from side

Complimentary



- Does each element come with one property in one direction and the other conflicting property in the other?
- Can the variable be oriented in a direction, such as force or velocity?
- Do any other directions have the conflicting property?
- Combine and orient elements in complimentary directions, the whole now has the required property in both directions.



Separate by Perspective What if you look at it in a different way ?

By Comparison



Compared to Old Standard



Compared to New Standard

- What is the variable compared to? Change that object instead. (Change the standard by which it is measured)
- **STRONG ACIDIFIERS:** Strong compared to small objects and Weak compared to large objects
- Easy for you and Hard for me
- It is _____ in my eyes and _____ in someone else's eyes

Tall
Compared
to Short
Door



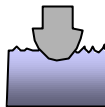
Short
Compared
to Tall
Door



Not
Buoyant
Compared
Water



Buoyant
Compared
to
Mercury

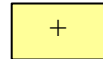


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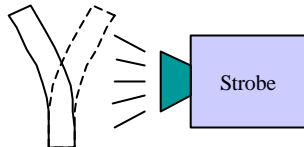
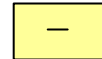
Something can be Expensive or Cheap depending upon the number of functions that it performs. (Also may be expensive to one customer and inexpensive to another)

How you Look

Normally



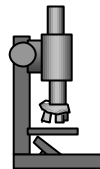
How you Look



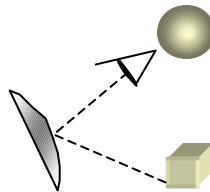
Object is moving and stopped



Object is Far and Near



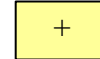
Object is Large
and Small



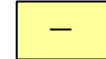
Square object
appears
rounded
through convex
mirror

Looks Like

Actual



Looks Like



Marble
and
Wood

Using Paint: Use Paint or equivalent to make something look like the opposite of what it is



Exist
and
Not
Exist

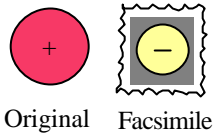
Using Camouflage: Use Camouflage to make something blend into its surrounding. It exists and doesn't Exist



Blond and Black
Hair

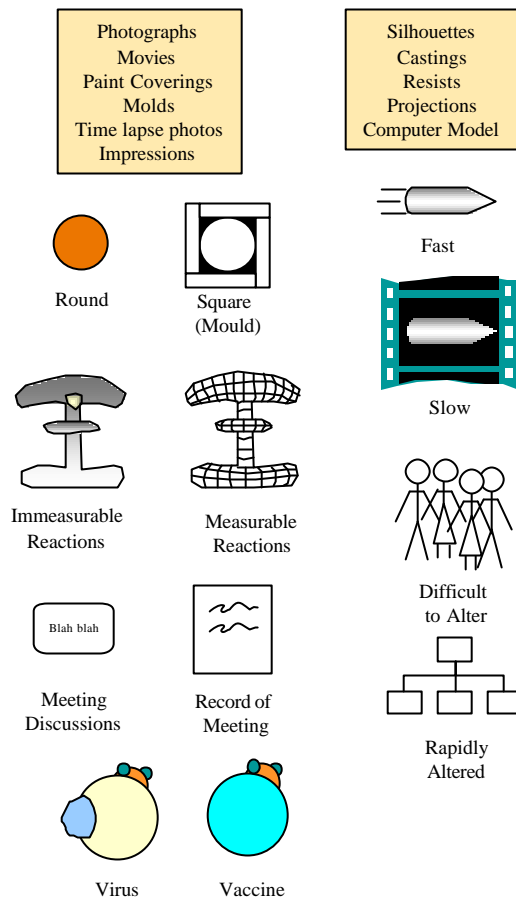
Using a fake object: The fake object has the conflicting properties. Its construction is designed to deceive the senses

Facsimile

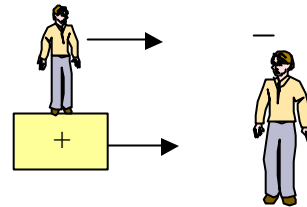


• Make a **facsimile** of the element that requires conflicting properties.

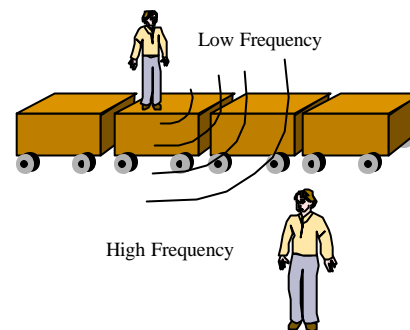
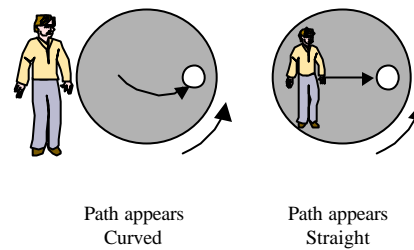
Consider the following facsimiles:



Frame of Reference

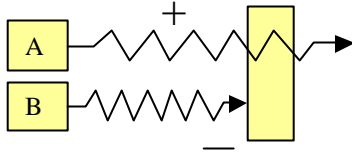


- Change your position, consider it from other points of view
- Move or rotate with the object in question

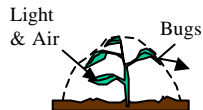


Separate by Field Properties

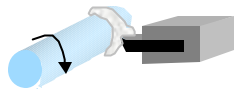
Transparency



HINGED ELEMENTS: Selectively passes solids in motion. May stop gasses and liquids and small objects.

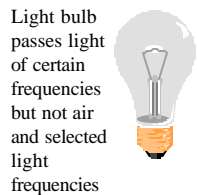


MECHANICAL FILTERS (Sieves, Fabrics, Filament wraps, Molecular Sieves): passes liquids or gasses



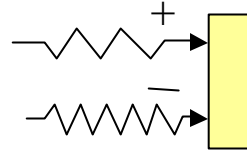
Evolved gasses are stopped by foam during machining

FOAMS, LIQUIDS, FLOATING SOLIDS: Selectively passes solids in motion. May stop gasses other liquids and very small objects. Especially consider inert materials

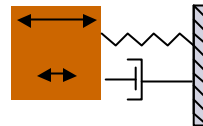


TRANSPARENT MATERIALS AND COATINGS (INCLUDING PAINT): Selectively passes physical fields. May be solids, liquids or gasses. May selectively pass certain frequencies. (Remember that all substances are transparent to gravity)

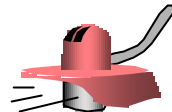
Frequency / Speed / Energy



- The system has one effect when acted on by a field at high frequency and the opposite effect when acted on with low frequency
- The system has one property at one linear or rotational speed and the conflicting property at another speed or when stopped



BY FREQUENCY: At low frequency the movement is large. At high frequency, the movement is small



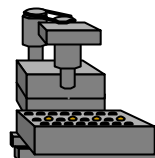
BY SPEED: String Trimmer: Stiff at high Speed but comes Flexible at low speed or when stopped



BY FREQUENCY: Fluorescent material only responds radiation at certain frequencies (Ultraviolet wavelengths)



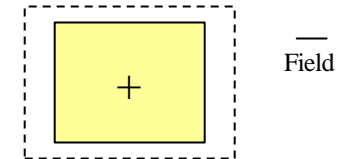
BY SPEED: When jumping from low heights, the water is soft. When jumping from great heights, the water is hard.



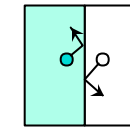
UNINTERRUPTED USEFUL EFFECT: When operating continuously, one machine may look like many machines

Separate Between Substance and Field

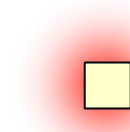
Separate Between Substance and Field



- The Field has one property, the substance has the conflicting property



The Gasses are not mixed, but the heat energy is mixed



The Object is square but the heated area is round



The Field Coils remain stationary but the field rotates

Implement

With the main problems now solved, it is time to create a detailed visualization of the idea, try it out, protect it and sell it.

Combine Solutions

Combine Solutions



- When several solutions are found, consider different ways that they can be combined. Especially if the ideal solution is not created.

Make Succession of Drawings



Journal

- Record Ideas as drawings in Journal
- Refine ideas by drawing successive pictures
- Perform calculations to establish drawing details

Permutate the Elements

ABC
ACB
BAC
BCA
CAB
CBA

- Must the elements come in a certain order ? Must they be nested in a certain order?
- Can the order be changed?

Reconsider Customer and Business Needs

PUGH

- Perform PUGH Selection techniques to verify that customer needs are being met and to get a comparison between concepts.
- Consider **refining** some of the concepts to give them higher ranking
- Consider **combinations** of ideas that give an overall increase in value to the customer.

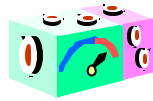
Optimize Combined Solutions

DOE

- Up to now, mostly screening tests should have been performed to determine rough cause and effect.
- Combine concepts into two-level DOEs.
- Output of DOE will give sensitivities and interactions between knobs.
- Consider **refinements** to the final concepts based on the outcome.

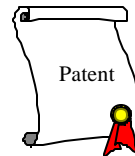
Reduce to Prototypes

Build and Test Cheap Prototypes



- First prototypes are used to determine whether the ideas will work. As such, they should only include the basic elements necessary to convince you that the idea will work.
- Keep it Cheap
- Write down all drawings and test results in your journal

File for Patents



- First file a for a provisional patent. This gives one year protection to further test the invention and to sell it
- Get forms from USPTO web site. Costs about \$80 to file.
- If everything is OK at USPTO then will receive filing date in 6-8 weeks. You are now "Patent Pending"

Refine Aesthetic Form



Journal

- The aesthetic form if the invention is often important, especially if it is a consumer product. Take time to make drawings which reflect a form that customers will desire

Build and Test Refined Prototypes



- The refined prototypes will help you see how the public will perceive your invention.
- The tests at this point should not be public.
- Write down all test results and drawings in your journal

Public Test of Prototypes



- Write "Patent Pending" on everything that the public can see.
- Conduct public testing of prototypes.
- Continue to log test ideas and results in the journal.