
empty canvas : wondering mind

an artisan's workbook

compiled and written by miriam louisa simons

for all the extraordinary students
I have been privileged to work with and befriend

you asked for it: here it is

may it nurture your own creative questions
as they form the ground beneath your feet



Blind Men on a Log bridge
By Hakuin Ekaku
(The Gitter Collection)

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6 creative constraints

scaffolds and skeletons	3
shape as scaffold	8
geometry as skeleton	12
form as scaffold	18
function as skeleton	22
line as scaffold	27
words as skeleton	31
light as scaffold	34
color as skeleton	38
references	44



The enemy of art is the absence of limitations.

Orson Welles

It is in working within limits that the craftsman reveals himself.

Goethe



CREATIVE CONSTRAINTS

**and how the paradoxical power of limits
can catapult the curious mind
over the hurdles and into what it loves ...**

In a series of books that goes on at such length about the crucial role of play, it might seem strange to include one called **creative constraints**. It might seem academic. It might seem *constricting*. Constricting and constraining aren't the same however, and one of the great fallacies about creativity is that it must 'happen' out of nothing and nowhere. The truth is that nothing happens out of nothing and nowhere. Creative things happen when our ideas about what 'should' happen, based on what we have been trained to expect, relax and allow the unexpected and the uninvited to play. But just because what happens appears to arise out of the blue it doesn't mean that it comes from nowhere. Is there any such place as nowhere in the universe? Is there any such thing as nothing? Nothing is still *something* – and it turns out to be the most fertile thing in creation.

The power of limits, of constraints, is another open secret that lies on the other side of our ideas about creativity. Constraints power our play and save us from drowning in the infinite ocean of possibilities. A constraint is like a frequency band on a radio receiver – tuning into that airwave, and playing with what flows forth for us there, gives us firm ground to stand on and a playground limited only by our choices. If you protest that such a notion seems to limit creativity I invite you to step out of your concept and experience this for yourself. Playing within limits opens the door to the limitless and artists spend their lives doing just this.

As imagination gives vitality to form,
Form keeps imagination from driving us into psychosis.
This is the ultimate necessity of limits.
Rollo May (1)

Do we ever have all the colors in our paint-box that we think we need? Do we ever have all the technical knowledge we need? Do we ever have enough time? No. We have what we have, and we play with that. We start out from where we stand *as if* we had it *all* and knew *everything we need to know*. And like a flower, we unfold our making as we go along, taking step after step in the dark. This is what it means to live at the creative edge.

scaffolds and skeletons

scaffold:

a construct to support one, so one's stretch is extended to what is usually out-of-reach.

skeleton:

a way of containing or limiting, an arrangement of components, framework, bones.

I began making notes for **creative constraints** by wondering about the way in which a worldview serves as a **scaffold** upon which we clamber about attempting to make some sense of our daily lives. And I recalled reading a myth from the rich storehouse of Hindu philosophy about *The Web of Indra*. In this exquisite image, the universe is seen as an infinitely spreading net or web that has a precious gem at each intersection of the threads. The gems are multi-faceted, and each face reflects every other gem as well as the threads, endlessly, to infinity. Every fragment existing anywhere in creation is reflected in each of the gems. Everything is interwoven and interdependent.

It fascinates me that this image is simultaneously a scaffold and a **skeleton**, and that it is also breathtakingly lovely. In my own mind's eye I saw neither gems nor spheres. In their place were question marks made of mirrored crystal, and the entire web was the woven pathways of wondering mind. Perhaps, I thought, the life energy itself is an infinite progression of questions. And what if the unfolding movement of consciousness towards ever-greater coherence-in-complexity feeds upon those questions waiting to be asked?

I think back to my early experiences in the art room at high school. Although that room was the center of the universe for me, I was only permitted to take art as a 'failing subject' – one that didn't make a difference in my exam scores – as my *real* strengths (so they said) were in English, math, and science. The caliber of the art teacher reflected the status of the subject at the school. He occupied a part-time post in a highly academic college where art wasn't valued except as decoration for the hall on the occasion of school dances. We scarcely saw that teacher, and received no formal or informal instruction whatsoever.

I dash up the stairs two-at-a-time, enter into the luscious light of the art room; the aroma of oil paint and turpentine is the most heavenly perfume to my senses; the pots of color on the shelves fill me with excitement; brushes, tubes, papers, easels, palettes, oh yes yes yes, I want to make lines dance and color vibrate. Will we learn how to do it today?
My eyes scan the room hopefully. My heart sinks when I see the same dusty, tired, uninspiring group of still-life objects set up on a desk. Mr. D enters reeking of cigar smoke, newspaper in hand.
"Paint it," he commands. Wanders out again.
No one dares ask, "But how, Sir?"

Never has nature been more seriously *mort* than in those sessions. I think that I had an early inkling then, at 14 or 15 years of age, of what was crucially lacking, aside from the teacher and any art education from him! What we needed – particularly those of us who were total beginners – was a safe place to stand, secure parameters, and some juicy questions to explore with our hands, hearts and heads. With the benefit of hindsight I can now appreciate how well that inkling has served my own experiments in creating, and how it helped me understand the needs of my students.

If you have been experimenting with the activities in the last three e-books, you have already experienced the power of constraints. Even when invited to create whatever you wished after experiencing inner journeys you were safe within the framework of your story, and you made decisions about material and technical constraints as you played with making an externalized, non-verbal, version of that story.

This e-book simply focuses our awareness on the way that the art of constraints allows us to move deeper into what we love. Think about what was really juicy for you amongst the activities played with so far. Try to think about it in terms of the elements of visual language: *color, tone, line, shape, form, pattern and texture*. Look in your X-file for clues.

Just as we all have preferences with verbal language – some people love poetry, others don't – you'll find you are more attracted to some elements of visual language than others. You're probably attracted to more than one, but let's choose the predominant one to begin with. That choice will help you decide which scaffold you want to explore in this chapter.

Perhaps you've discovered that you love to use *lines* – probably for drawings, and maybe paintings as well. The **line** scaffold will probably appeal to you. Perhaps *shapes* of all kinds fascinate you and beckon you to the playground. Climb up on the **shape** scaffold. If you love *forms* in either two or three dimensions the **form** scaffold will interest you. Or perhaps you have found an irresistible urge to explore *light* and the way it manifests as color. The **light** scaffold awaits you.

Maybe a combination of these elements attracts you, for hidden within them is the entire grammar of visual language. And if you are a teacher whose intention it is to cover the syllabus of this language, you will find that all the elements are included within the four scaffolds suggested and can be expanded and developed according to your curriculum.

In **wildsight – the innocent eye**, we made the acquaintance of formal aspects of these four scaffolds. We have looked at the *edge* aspect of *line*; at the *relationship* aspect of *shape*; at the way in which *form* is defined by *light*; and at the marvels of *light* that appear to our senses as *color*, *tone*, and *texture*. So we have some foundations upon which to build our scaffolding. As we do so, ideas will crowd onto the platforms – too many to remember – and we will need to make notes about these inspirations in our X-file for they are the embryos of skeletons that may be fruitful later.

Scaffolds exist to serve and not to enslave us. They can be dismantled, re-designed, re-used elsewhere. Up they go to assist us with the task in hand – down they come when the job is done. In the artisan's workroom we find that with the help of a scaffold we can cover greater territory. We can also deepen our inquiry by using the focus provided by our scaffold, just as oil is reached by way of a scaffold supporting an excavating drill. Skeletons are another story, for their bones usually remain as the integral form upon which we build a work. Remove those bones and the work will collapse; it will lose coherence and it will lose whatever vitality was born of the dynamics of its making. "If form were to vanish, spontaneity would go with it." (1)

As we have already seen, within the parameters of a skeleton lurk almost limitless possibilities – a seeming contradiction in terms that is quickly dispelled by a few minutes contemplation of the structural limits of nature in her design work. (2) It is easier to uncover marvels when working within limits – goodies we probably would miss if there were *carte blanche* to do whatever we wish. The paradoxical danger of *carte blanche* is that we usually settle into the comfort zone of the *known*, the tried and true. We reinforce habits, concretize our ideas a little more. There may be self-satisfaction, but there won't be any surprises.

Structure makes our creative work possible. In fact the very first steps in any creative project are likely to be the establishing of parameters and conditions appropriate to the task. So structure can be seen as a vital ingredient of the creative process. To assume that structure/ skeleton, and creativity are somehow incompatible is to be fooled by the *creativity-is-a-divine-gift-bestowed-upon-the-few* myth – one of the most insidious blocks to creativity in our culture. One of the greatest impediments to creative work is a *lack* of scaffolding and skeleton, plus the notion that it *shouldn't* be necessary to use them.

By skeleton we do not – *definitely* do not – imply pre-determined outcomes. Nor do we mean, here, developing designs and then slavishly adhering to them. These disciplines may well apply elsewhere, but have little relevance to our task of exploring and freeing up creative activity. Unless they relate to the operating of highly technical equipment for example, pre-ordained inflexible rules or mindless discipline are powerful inhibitors. We create our own playground rules as part of our preparation for wondering and creating. They are purpose-designed, user-friendly, and we change them regularly – just so we don't get stuck in habit-land.

... creativity involves the expansion of a field of endeavor using ideas which could not emerge simply by following the usual rules.

Mindlessly breaking the rules is not enough, however: a close inspection of any creative work will show the presence of some constraints ... those who apparently defy these rules are in fact sticking to their own constraints, which include avoiding traditional forms. (3)

A scaffold could be the work of an artist who has gone before us. If we've looked at their work it's stored in our mental archive and we stand on their shoulders, whether we are consciously aware of the influence or not. Whilst doing our research upon the scaffold, we might decide to deepen our exploration by designing a structure/skeleton within which we play with elements typical of the world of that artist. For example, if you were to create a *scaffold* on which to study the life and times of Albrecht Durer, you might decide to make a *structural* exploration of the drawing of natural history subjects, or of wood-block printing techniques.

Here are some other ways that scaffolds can lead to skeletons:

scaffolds	→	skeletons
wondering about:	→	in-depth experiments with:
dimension/scale	→	one size format (e.g. miniatures)
environment	→	using found objects only
another culture	→	one traditional craft
philosophy	→	one idea (e.g. order; harmony)
your experience	→	one emotion or happening
biology	→	images from microbiology
actions of making	→	one process (e.g. wrapping; stacking)
festivals	→	an 'original' celebration
mathematics	→	'magic' squares; sacred geometry
architecture	→	sustainable dwellings
science	→	experimental articulated models
music	→	vibration and color correspondences
textile surface design	→	one technique (e.g. shibori)

A structural skeleton can also be as simple as deciding to study something for a certain amount of time. Or choosing to use a limited palette, or only one tool. It can consist of only two or three bones, or of dozens. Sometimes a skeleton could begin with a mind-map – see Tony Buzan's books for great ideas.

Don't overlook the gold mine of tradition in a dash towards 'original,' creative conclusion – the limits imposed by traditional constraints can be wildly liberating for the disciplined artist. Tradition-enriched work clearly isn't the same as tradition-bound work. There's a world of difference between the two – a world in which the maker has been free to explore wondering mind within the supportive vocabulary of shapes, tools, materials and ways of working, without being suffocated by its expectations. We are in that happy situation.

After building and simultaneously exploring a scaffold for a while, we will focus our experiments in one structural area that relates to that specific scaffold. For many ideas about ways of exploring these scaffolds, I am again indebted to Natalie d'Arbeloff. (4)

Choices for skeletons are endless. Those I offer here reflect my own research and practice, and are offered as suggestions, starting points. Please make up your own!

Why do apple blossoms always have five petals? Only children ask such questions. Adult pay little attention to such things, taking them for granted, like the fact that we use only as many numbers as we can count on our ten fingers.

When we look deeply into the patterns of an apple blossom, a seashell, or a swinging pendulum, however, we discover a perfection, an incredible order, that awakens in us a sense of awe that we knew as children.

Something reveals itself that is infinitely greater than we are and yet part of us;
the limitless emerges from limits.

... we have lost sight of the power of limits. (2)

shape as scaffold

Start by doing some investigating and recording. Make a Shape Book, or use your X-file.

- **shape-stalking**

How many different kinds of shapes can you find when you observe the silhouettes made by natural objects in space?

Make a list – square, elliptical, contorted, blurred, punctured, rippled, etc. Illustrate your list with visual examples.

Make another list to go with the first one – finding other objects, perhaps man-made, that the shapes remind you of. Try to find or make illustrations of these objects too.

Then experiment with some practical play:

- **shape-making**

On a large sheet of paper, paint 'outline shapes' and 'blob shapes.' (5) Make them touch, overlap, or stand apart. Add colors to fill in the outline shapes, and to put other smaller shapes on top of the blob shapes.

Re-visit the *Indian ink and water* activity in **making fun of play**, making shapes with water and touching the ink-loaded brush into them.

The *beautiful blots* activity is worth another look too – see if your descriptive word skills are up to accurately portraying the wonderful symmetrical shapes you can make this way.

Experiment with paper cut-outs. Fold paper in several parallel lines, cut shapes out of the folded edge (the way you might have done when you made those strings of paper dolls years ago).

Open the paper out and play with both the cut-away portions and the rest on a background sheet of paper. Accentuate the shapes with color if you wish. This might remind you of your experiments with positive and negative shapes in **wildsight – the innocent eye**.

Cont ...

Experiment with ready-made shapes that you can manipulate: jigsaw pieces, children's toy shapes. Revisit the *Tanagram* puzzle and invent one of your own.

Collect commercially produced templates designed for use by architects, mathematicians, biologists, sign-writers, and explore their oddities. Try making a composition using only these shapes juxtaposed in unusual ways.

Think about the kind of relationships that occur in the shape-world:

- **shapes meet other shapes**

When shapes overlap, touch edges, or are separated by space, do they exert any influence on each other?

What happens to their relative sizes, their colors, their positions?

Use your finder as you did when looking at relationships and proportions in **wildsight – the innocent eye**.

Write down what you perceive, and any other questions that come to mind.

Then explore those relationships practically:

- **shapes in relationship**

Cut a variety of shapes out of cardboard and arrange them on a surface with some overlapping, some separate. Place a sheet of paper on top and make rubbings with crayon or charcoal. This technique (frottage) is interesting because it transforms shapes into areas contained within lines, and can be a good starting point for an abstract work. What happens to the quality of the shapes when they are transformed in this way?

Revisit *frame ups* in **making fun of play**: Tear pages filled with colored pictures out of magazines, place them in a random pile on the floor and rove over the kaleidoscope with your finder looking for juxtapositions that demonstrate the way shapes influence each other. Look at the way shapes recede or advance depending upon their color.

Cont ...

Try making shapes out of various materials: plastic, cloth, card, old photographs. Play with them together, making interesting arrangements and use your finder to focus more closely on the relationships that occur. How do the different surface textures modify those relationships?

Think again about the experiments with positive and negative spaces you did in **wildsight – the innocent eye**. Try an extension of that idea by cutting out shapes in black and white paper. Which color does your brain see as a 'negative' shape – black, or white?

Experiment with making shapes appear to move backwards or forwards in space by manipulating their color and tone, and their dimensions.

Explore the surfaces of shapes:

- **shape and surface texture**

What kinds of textures occur on organic surfaces? Make a list – spongy, pitted, velvety, patterned, etc.

What kinds of textures occur on inorganic surfaces? Corroded, embossed, polished ...

How do these textures affect the profile or contours of a shape?

Do the surface textures of organic objects reveal a pattern – one that decorates, camouflages, or reveals an inherent design-controlling growth?

Collect samples, actual or photographed, of the kinds of surface textures you have discovered.

Experiment with processes that can imitate these textures:

- **tactile shapes**

Try using white woodworker's glue to make an 'organic' relief on wood, let it dry, rub oil paint into it, and then wipe away the surplus.

Cont ...

Apply white acrylic paint thickly to a surface and before it dries press plastic construction-set pieces into it to make indentations. When it dries brush ink over the surface.

Draw a shape with white glue onto a piece of glass. When it dries, peel it off, apply ink, and make a print with it by placing a paper on top and pressing hard with a roller.

Wet a sheet of watercolor paper, brush some color into the damp surface, then press crushed cling film over all, or selected areas. Leave it to dry thoroughly before removing the cling film – the color will have moved into the creases imprinting organic shapes that would be virtually impossible to paint with a brush.

Revisit **wildsight – the innocent eye** and look at *textured impressions* with your shape eyes on. Make a sampler of textured shapes in clay.

Take another look at the activities in *playing with chance*. Also note that interesting textures can be created with paper pulp. Try combining paper pulp with unusual stitches. And if you enjoyed playing with Shibori techniques, try using them on synthetic fabric – the relief effect created by the binding will remain in the cloth if it is dyed in very hot water. Textured shapes made this way are part of the tsujigahana technique and feature on the most exquisite (and expensive) kimono.

Almost all of our wonderings about shapes have been focused on exploring their organic and random qualities, but there is another whole universe of shape which we have only fleetingly noticed so far. It is the universe of mathematical shapes called geometry – and it is full of untold wonders waiting to be explored. We saw how sometimes the surface texture and patterning of a natural object reveals a pattern of growth. We can explore these patterns as well as others that permeate the natural world more closely, by using geometry as a **skeleton**.

geometry as skeleton

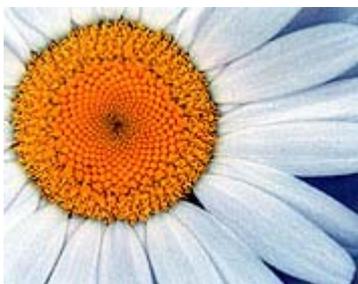
how do shapes order themselves?

Using geometry as a skeleton opens a window onto the exquisite art created by nature. When people claim that there are no straight lines in nature, they are ignoring the universe of crystals whose growth is a demonstration of the miraculous way that shapes can order themselves. (There are many other straight lines in nature's visual language – can you name some?)

If you cringe at the word geometry because of its association with mathematics, the projects here might help to release that limiting fear. The universe of geometries is vast, and its research and documentation occupies volumes of books. We will only tiptoe up to a reachable window here, and peek through the curtains at a few simple examples that are fun to explore without requiring advanced mathematical knowledge. Beware, though, for you just might find yourself stepping into a field of research so utterly fascinating that it preoccupies you for life. And at the very least, you'll never see nature again the same way.

If you cannot find a fresh, blooming, sunflower for this project, find a clear frontal picture of one in a book. It need not be in color.

- **the 'simple' sunflower**



Study the shape, the lines, the textures of your sunflower – commit maybe a half-hour each day for several days. Do little drawings of the details that interest you, and make lots of notes.

If you are really observant, it won't take long for you to become aware of a certain dynamic order in the way that the flower has grown, and in its design.

This is where your research begins. First of all, find books that have information about the geometric growth patterns of organic and inorganic life forms. (See **references.**)

Cont ...

What can you find out about

- the sunflower's growth spirals?
- the 'golden section,' as contained in the spirals?
- 'Golden rectangles' in general?
- the Fibonacci series, shown in the arrangement of the seeds?
- Irrational numbers?
- other natural objects that share these growth dynamics.

(Look at pine cones, nautilus shells, etc)

Make a Sunflower Book containing all your research findings, your illustrations, your questions and your ideas about how you could use this knowledge in your own designs.

Some artists use skeletons of geometries (yes, there are several: Euclidean, geometry of measure, projective geometry, co-ordinate geometry, non-Euclidean, fractal, and topology to name a few) as the formal basis for their work, and within that framework feel free to be wildly intuitive with color, tone, and texture. Look at the amazing art of Escher.

If you are one of those people for whom math classes were interminably long, chances are you will have already made the acquaintance of the diagram below as you doodled with compass, protractor, and pencil. I don't remember what we called it back in my school days but it is known nowadays, in 'new age' material anyway, as the Flower of Life. It is an appropriate name, for this diagram generates the geometric shapes of circle, triangle, square, as well as the configuration we call the Star of David.

We will draw it first, and then experiment with 'uncovering' those shapes. A word of warning at the beginning however – sloppy, inaccurate work is incompatible with the marvelous intricacies of geometric diagrams. Put on your best artisan's cap at the outset, and you will avoid frustration and disappointment down the track.

- **flower of life**

You will need a good compass with a fine lead point, and a sheet of drawing paper.

Set your compass at a radius of 3cm. All your circles, except the final enclosing circumference, will be that size. Draw a circle that size in the center of your paper.

Cont ...

Next draw the 6 circles that surround the central one, so that they just touch each other and no more.

Draw the 6 circles whose centers lie at the points where the circles in step #2 touch the circumference of the central circle.

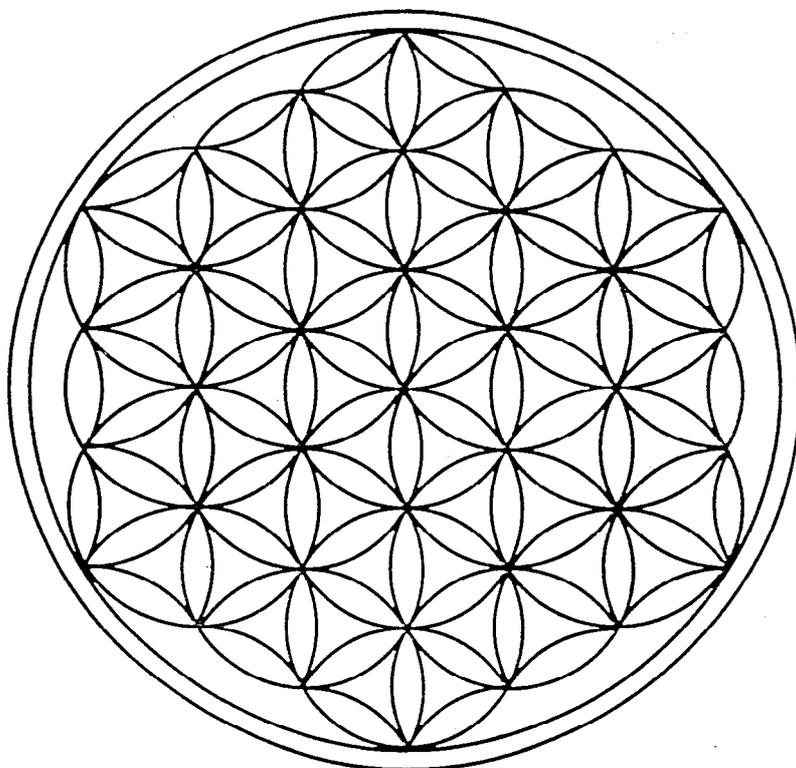
Draw the 6 circles whose centers lie at the points where the circles in step #2 touch each other's circumference.

Draw the 12 semi-circles whose centers lie at the peripheral points where the circles in step #2 cross the circles in step #4.

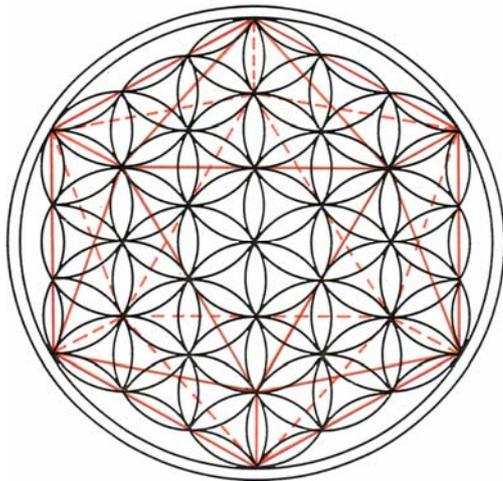
Draw the 6 arcs that join the centers of the semi-circles drawn in step #5, and if desired, the remaining small arcs at the outer edges.

Measure the distance from the center to the outer edge of your diagram to find the radius of the circle that will enclose it. Draw that circle.

Your Flower of Life is complete. Make 5 or 6 photocopies of it, so that you can explore the geometric shapes hidden in its configurations.



In its spherical form, the Flower of Life generates the cube, tetrahedron, star tetrahedron, icosahedron, dodecahedron, and the octahedron – all the 'Platonic' solids. And it demonstrates how these forms are generated in five-step cycles that form an infinite progression – an excellent project for exploring form as structure.



We have seen how the little circles generated the large circle. Can you find a square, some equilateral triangles, and a Star of David?

Use colored lines to trace the shapes.

Can you find any other interesting shapes? Use color to define them.

Can you find any shapes that remind you of those you found whilst exploring shape scaffold?

Lawrence Blair, in *Rhythms of Vision* (6), writes "Sacred geometry ... concerns itself with the 'order in space' whereby 'existence' unfolds with minimum effort and maximum harmony through successive modes of energy." He notes how our very earliest perceptual experience involves an ordering of objects in space and goes on to say that "sacred geometry graphs how 'dimensions of vision' unfold, either in the natural universe or in our own psyches. Its basis is the sphere, or circle, whose shape, both as infinity and totality – nothing and the basis of all beginning – resonates life."

Form is the envelope of pulsation.
Tantric aphorism

The Flower of Life is a good introduction to that concept of 'unfolding existence,' and it also demonstrates how beautiful the visual harmonies created by that unfolding can be. In this instance we can see how a worldview can be represented by the simultaneous use of a scaffold and a skeleton. Can you see how the Flower of Life fulfills this function? Did it stimulate insights as you created it? Keep notes in your X-file.

If we stay with the shape of the circle (we could see it as part of our skeletal limitation), and explore its wonders further, we might begin to see the shapes it generates in a new light. Most of us are familiar with the *mandala* concept – we experimented with one in **outside-in & inside-out**. And those who have been to Japan might have been fascinated by the ingenious use of circular formats in the design of mon (family crests) and tsuba (sword hilts). We might have looked at *mimbres* pottery with its decorative designs formed by divisions of the circular format. Or *chladni* figures, which make visible the patterns created by sound vibrations when sand, scattered on a circular disk, dances to the accompaniment of a violin string's pitch.

Contemporary British artist Susan Derges has experimented with this concept, creating an exquisite and utterly wonder-full video showing white powder on a black surface dancing from one circular form into another to the accompaniment of music. As I watched this video I was entranced to see the Flower of Life, stained glass windows, Zen circles, and snowflakes appear and disappear in a continuous choreography of visual harmonies.



Snowflakes are truly amazing. They all vary, and yet they all share the same basic hexagonal pattern.

You have drawn that hexagonal shape in your Flower of Life – it was generated by your circles, and formed when you drew the large, enclosing circle.

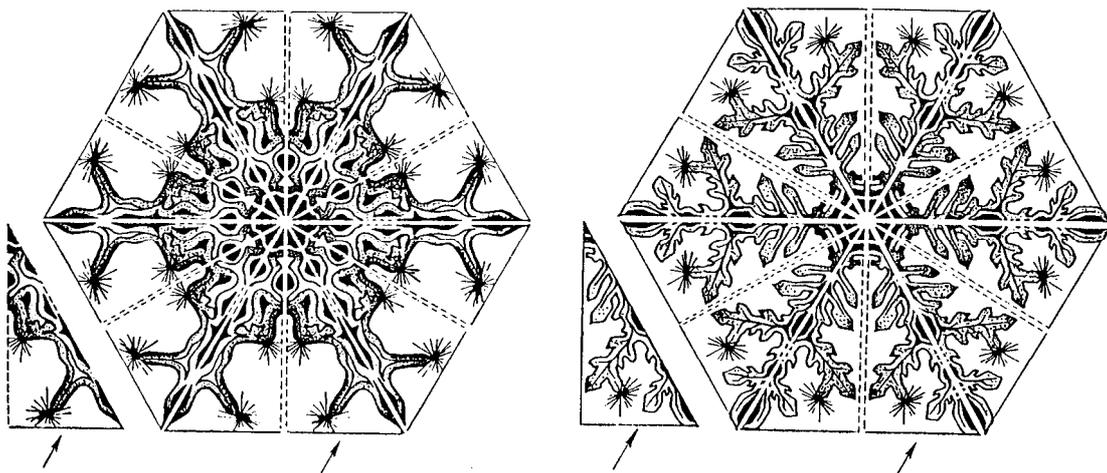
- **snowflakes and stained glass windows**

If you connect each point of the hexagon with its opposite point, you will have the skeleton of a snowflake.

Now draw a second set of diagonal lines dissecting the 6 'pie' shapes, so that you now have 12 triangular slices. These 12 triangles contain the design that creates one unique snowflake.

Cont ...

See how many pictures of snowflakes you can find – the books mentioned above will be useful. Photocopy the designs then analyze them in terms of the fundamental triangular design.



Make up your own designs. Draw at least 6 of them in your X-file, showing how the pattern unfolded.

Now make a huge conceptual leap and see your snowflake designs as potential patterns for a commission to create a stained glass window for a new cathedral.

Look at the famous Rose windows from Notre Dame and Chartres cathedrals, and if you live near a cathedral that has a circular stained glass window you can study its geometry first hand. These windows are well analyzed and documented – you will find relevant books in the library.

Choose one example that you find fascinating, and make your own analytical drawings and notes.

Put your snowflake designs together with your Rose window drawings, and see what you can see!

The final drawings will be a creative synthesis of the two areas of research, and probably will have opened up understanding about how the great art of the past had its design roots in the natural world experienced by the artisan.

form as scaffold

First we need to be clear about the difference between shape and form:

Shape refers to the filled outline of an object when it is seen against a backdrop of space. If we hold an orange in space, its shape is a circle. Shape implies two dimensions.

Form refers to the volume of space occupied by an object. In the case of the orange, its form is seen to be a sphere. So form implies three dimensions, mass, and weight.

- **feeling our way into form**

Think about the room you are in and describe its dimensions relevant to your position.

Then think of the whole building, or house, and do the same, trying to really feel the volumes involved.

Take a smaller object such as a book, and think of it in terms of its dimensions and the volume it displaces in space.

- **forming forms**

Now take a pencil and a sheet of paper, and turn yourself into a tiny insect. You are walking over the surface of the book and your pencil is tracing your footprints. When you get to the edge you continue down, and soon you are walking across the back, up the other side, and over the front again. Your pencil is tracing every step on the paper in front of you, whether the surface you are traversing is visible or not.

We call these drawings *wrapping drawings* because it often feels as though the object, or the model, is being wrapped up in miles and miles of thread. Important – we aren't trying to draw the object realistically!

By the time you have covered every speck of the surfaces of your object, its dimensions in a different way – kinesthetically, rather than conceptually. This is the way a sculptor 'knows' dimensions.

Cont ...

Do lots of studies of simple geometric forms like boxes, cylinders, and pyramids from different angles, using the 'wrapping' technique. Then try cutting the shape out of card, gluing it onto paper then imagining it to be a three-dimensional form rather than a two-dimensional shape. Draw the missing parts of your image. Try doing this from different angles.

Try focusing on one aspect or quality of form – for example, concave, monumental, fragile – and constructing or drawing forms reflecting those qualities.

- **form and function**

What does the form do? Does it have a function?

It's hard to imagine a form that serves no function whatsoever – can you think of one?

Make a list of the work done by forms : contain, enclose, wrap, protect, etc.

How does a form work in relation to its surroundings, its neighboring shapes, its users?

Look at forms in nature:

seed pods
bones
honeycombs
birds' nests
shells

Look at forms in architecture:

columns
buttresses
steps
steeples
chimneys

Make verbal and visual notes of your observations in your X-file, or in a special book.

Later we'll be exploring the function of form as a skeleton, and your notes will be useful.

- **forms at work**

Using everyday materials at hand, like egg cartons, cardboard cylinders from empty rolls of kitchen towels, golf balls, wooden toy blocks, make constructions of forms that serve functions.

Then, make small drawings of your constructions using your finder to isolate the areas that reveal something about function.

- **moving forms**

Does the form dance in the breeze? If so, to what purpose?

Do other natural forces make it move? (Think about weather-vanes, tidal effects on oysters, flowers being visited by bees and birds, pods bursting with forest-fire heat etc.)

Does some kind of mechanized effect make it move?

Write down a list of as many words as you can think of that describe the movement of forms you can observe first-hand:

float, swing, flutter, bounce, spring ...

Then try to find lots of pictures of other things that share these types of movements – unlikely things. You may have thought about the way a sponge floats, for example, and then find a photo of an astronaut floating in space.

Why not put these pictures together to create a visual analogy?

- **making moving forms**

- make a mobile**

In India we gathered hundreds of pods from the Rain tree – long narrow forms with little seed recesses. We cleaned them, painted them white, put rainbows of color steps in the seed recesses, sorted them into graduated sizes in groups of seven pods, threaded them together horizontally on strong fishing line, and hung them from trees to twirl and float and spin in the air.

Mobiles can also be made with other components – paper, wire, feathers, anything that will move in space.

- make a spinning toy**

Another idea from India. The top part has two little balls attached to it by string, and it balances on a pole that forms the lower part. When the top part is spun, the balls fly up and out like arms; as the momentum decreases they lower and wobble, until the top part tumbles.

Invent a new version of a toy that has movement like this.

make a people-carrier (Adapted from 8)

Cars are forms that carry people. Using a plastic egg, wire, and other little suitable objects (cotton reels etc) see if you can re-invent the car. Can you do it without resorting to the use of the wheel? How will everything join together? How will it move? Will it be mechanized? How?

Try other experiments with pendulum motion, with levers, seesaws, springs, and turntables.

When movement serves form's purpose it becomes one of the skeletal components for a design. The *people-carrier* project is as much about function as form and could have just as easily appeared in the *function as skeleton* activities that follow. In fact form and function are inextricably bound together. Which do you think comes first in nature – form or function?

When the artisan turns his or her attention towards designing a tool, they are firstly concerned with the function it must serve. Let's explore function as a skeleton.

function as skeleton

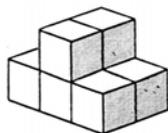
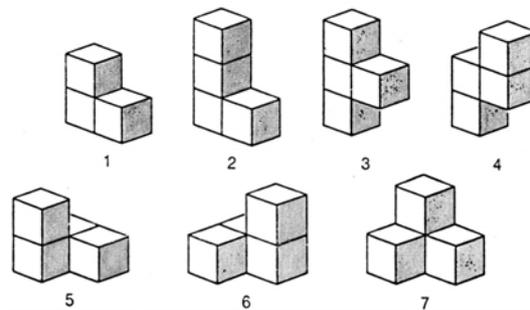
What comes first – form, or function?

The first activity comes from Robert McKim, who includes it in his book *Experiences in Visual Thinking* (9) as a way to externalize and observe the ways we solve three-dimensional problems – or problems of form.

The activity itself "was invented by the Danish poet-scientist Piet Hein, who discovered that when three or four cubes of the same size are combined into all possible irregular configurations within a $3 \times 3 \times 3$ matrix (by joining their faces), the combined cubes can be fitted together into a larger $3 \times 3 \times 3$ cube." (9)

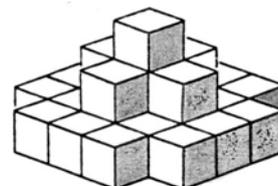
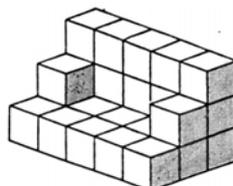
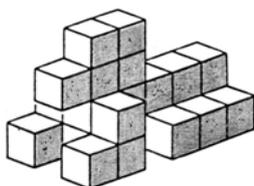
- **soma cube constructions**

Glue 27 children's blocks, or equivalent-sized cubes, into the seven Soma pieces as illustrated.



When they are dry, take just two pieces and make the step form, left.

Now put all the pieces into a single cube. Note that there are several ways to do this.



Can you construct the dog, the sofa and the pyramid?

Invent forms that would serve other functions using the Soma cubes.

- **invent a new helper** (adapted from 10)

Imagine that you live at a time when human beings were just beginning to invent extensions of their hands – called tools. Think of a basic daily chore for which, as yet, a helpful tool has not been invented.

Make a list of all the needs that must be met by the tool. Try to forget all that is already known, plus all your pre-conceived ideas and just consider factor after factor, freshly:

- What weight must be borne?
- Who will use it? What capacity do they need?
- How will it be used?
- How will it fit – into the body, the hands, the head of the user?
- What opening, if any? What size? What handle?
- How will it be cleaned? Can it be heated?
- What possible material? What 'cost' to make?
- What possibility of recycling later?
- How does it sound when used?
- Is it pleasant to look at?
- Will it be satisfying to own it?
- And so on ...

Now make your tool.

... the most powerful drive in the ascent of man is his pleasure in his own skill.
Jacob Bronowski

Packages are an art form in Japan. Sometimes their ingenious beauty surpasses the quality of their contents. In the inspirational catalogue that accompanied an exhibition called "The Art of the Japanese Package" (11), which toured New Zealand, Australia and the USA a few years ago, the author Hideyuki Oka casts some light on the attitudes of the artisans who created the exhibits. I'm including them here because they make beautifully explicit the commitment to care and artisanship required in authentic creating.

The motivation of these artisans was entirely personal.
They could not resist the desire to perfect their art.
They were driven by two considerations: an aesthetic philosophy that said
everything could and should be made beautiful
and a value system in which all objects, large or small,
expensive or cheap, were of real value. (11)

He goes on to note that there are three characteristics of traditional Japanese packaging:

- 1 The use of natural materials – wood, bamboo, straw and clay, as well as their derivatives, paper, cloth and ceramics. These natural materials are used in ways that reveal their textures and their freshness. So the gifts of the natural environment are celebrated rather than trivialized, and are in a sense re-created by the hand of the artisan.
- 2 Wrapping and packaging are seen as a kind of ritual – for if everything has value everything is treated with respect. The ancient concept of cleanliness and purification also creeps in, so that items carefully packed or wrapped are seen as distinguished from other items that have not been purified.
- 3 The evidence of the subtlety of handwork of the artisan. This reflects more than the manual dexterity and the desire for perfection in craft of the maker. "It is rather the feeling of love and consideration for others that motivates them to do this handwork." People love to open packages, even little envelopes exquisitely designed, and the artisan wants to offer that pleasure to another.

- **design and make a precious package**

First, decide what it will contain.

If possible do some research into Japanese packaging, or containers made by other cultures that you are interested in.

Make a list of questions similar to those above for the tool-making activity.

Think about the characteristics of the traditional Japanese package:

Limit yourself to natural materials.

Consider the way you conceive the notion of packaging. Is there a sense of ritual present? Do you feel that your materials and the contents have real value? How can you make them more 'special'?

Make your package with love and care. This is the way of the artisan.

What if one designed a package to live within? This is not as daunting as it sounds! If we stay within our skeleton of function, and keep it simple, we can have great fun designing ingenious living spaces.

Let's impose another skeleton in order to make the task easier: we'll use geometry as our design-form focus.

- **design a dwelling** (adapted from 12)

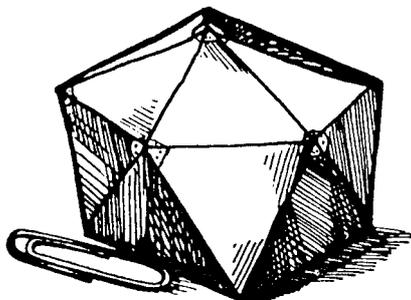
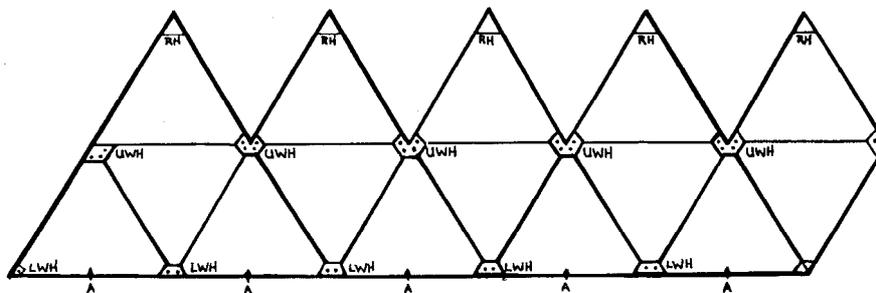
The geometric form that is sometimes used in the design of simple structures is the icosahedron. In its crystalline form, it is made up of 20 equilateral triangles, and if some of those are removed we have the form of a dwelling.

Design by Jim Bohlen
Copyright Greenpeace Experimental Farm



Make a model:

Cut out and assemble 15 equilateral triangles as shown in the diagram.



Bring the tips of the top row of triangles together to form the peak of the roof.

Now you need to decide how to make and place your windows and a door. Will they slant 'in' or 'out'? Will you have a skylight? Will you extend the roof triangles so that they form protective eaves? Will you want a deck?

Cont ...



Make more little models as you work, developing your ideas as you go.

What materials would you use for the walls? The roof?

What tools would be needed?

How much would it cost to build a small but habitable version? (Ask your local builder some questions.)

How would you design the interior?

What other uses can you think of for a structure like this?

This shape is ideal for a dwelling because of its simplicity of design, economy and ease of construction, great structural strength, and maximum utilization of a minimal amount of materials. Most of the major components can be pre-fabricated, and no power tools are required for its construction – so it is perfect for construction in remote places. There is a limit to the size of structure that can be built this way, but several of them could be built for different purposes and linked by covered walkways. Why not design an entire eco-village?



line as scaffold

how do we define a line?

do lines really exist?

or are there only configurations that appear to be 'line-like'?

- **line language**

Make a sample collection of all the kinds of lines you can find in nature. Edges, cracks, filaments, contours, ridges, all look like lines.

Photograph them, draw them, write about how they are formed, and what they remind you of. Describe them as though you were reporting newly discovered botanical or geological information.

Often lines are very expressive.

What qualities do the lines you have noted seem to express?

plodding, joyous, spiraling, skipping, slashing ...

- **line-making**

Invent ways of illustrating the kinds of lines you have discovered using unusual ready-made materials: string, wooden strips, doweling, piano wire, reeds, threads etc.

Glue them onto hard surfaces – perhaps they will be useful later for making prints.

Make a painting using black paint and lines only. See if you can make at least 10 different kinds of lines expressing different qualities.

Refer to *musical mind 2* in **outside-in & inside-out**, and complete your painting with colors.

Try incising lines into all kinds of surfaces using unusual instruments, then applying black paint, rubbing it into the incised lines, wiping it off, then rolling white paint onto the surface. The lines will remain black and be in sharp focus against the white ground.

Tear or slit sturdy canvas, then glue it onto a firm base.

Crush paper, smooth it out again, allow Indian ink to seep into the wrinkles, wipe away the excess, and then brush a paler color over the surface.



- **lines with feeling**

Can a line have any texture?

What if you magnified it?

Collect examples of lines with texture from nature, and describe them visually and verbally as before.

Remember that your visual skills are enhanced by written observation.

- **touchy-feely lines**

Draw with glue onto a board; sprinkle the lines with fine sawdust or sand.

If you have access to a ceramics workshop, borrow some clay and an 'extruder' – a tool rather like that used for cake decorating- and experiment with the kinds of lines
soft, mushy, firm, gritty ...

that you can squeeze out.

Play the Indian ink and water game, laying down lines of water, dropping in ink, and watching the way that the ink forms textural sediments. Cover some of the lines with tape – the ink will spread and create a textured pattern. Lift the tape off and make a print with the ink remaining on it.

Try making lines with a pencil on surfaces that have a rough texture: wallpaper, canvas board, sandpaper.

Try burning, carving, crocheting, knitting and stitching lines.

- **patterns in line**

Look at how lines intersect, run parallel, or run together.

Can you find regular and/or irregular patterns?

Find examples in nature – look in library books at coral, at the structure of leafless trees, at cross-sections of vegetables, flowers, shells.

Document your findings with notes and illustrations.



Now try experimenting with ways of making some of the patterns you have found, using unusual materials rather than simply drawing them in two dimensions.

- **pattern-making with line**

Try putting nails into a frame then winding colored string around them. Think about how you could portray the symmetry of a sunflower in this way.

Try making a 'Dream Catcher' – a circular, *mandala*-like sculpture from the American Indian tradition. You need a circular structure for a 'frame' (an embroidery hoop works well), and you create a web within it by looping and knotting colored yarn or leather thong.

Find some striped material – paper or cloth – cut it across the stripes and rearrange the strips to form new patterns.

Try stitching lines on canvas to form patterns. (The sewing machine can be a useful line-making tool.)

Use some yarn and a crochet hook to make simple netlike patterns. Explore library books to discover other ways of making nets.

Throw a handful of toothpicks onto a surface covered with wet glue; use the dried pattern as a printing block.

- **line in motion**

Follow lines in nature with your eyes to see whether they move as they grow.

Look at sweet pea tendrils, unfurling fern stems, exploding seed pods, drooping willow branches, stretching tree trunks, wrapping flower buds, exploring ivy tendrils ...

Remember how you explored the 'gestalt' of a model's pose in **outside-in & inside-out**, and look at lines that way. Experience the essence, the character of the line, by imitating its movement with your body – this is fun to do in a group with appropriate music. As before, make a sampler of all you can find, either first-hand, or from reference material.

How can actions like these be suggested using our tools-at-hand? Invent linear gestures for the line movements you have documented.

- **linear gestures**

Try making rubbings: place string or other fibers beneath paper and rub the surface with crayon or charcoal. Experiment with moving the string as you rub, or moving the paper and repositioning it.

Make some ink or pencil lines on a piece of paper, and photocopy them, moving the paper with different kinds of actions as you do so:

drag jerk slide stop-start ...

Make 'blindfolded' drawings: one person (not blindfolded) gives instructions about the quality, action, and placement of lines which the rest of the group follow. Re-visit the *esp drawings* in **outside-in & inside-out**.

Remember how Paul Klee described the way he thought of his drawings as "Taking a line for a walk ..."? Take a line for a wonder-wander. Use ink, pencil, thread, wax... (Look back at those experiments with *doodles* in **making fun of play**.)

If you've explored all these ways of looking at, and thinking about, line, you'll have built an impressive scaffold and recorded lots of valuable resource material for later projects.

Earlier I mentioned that there is little difference between the way lines are used to form written script and the way lines are used to form images. Since we are involved with lines of all kinds here, and since lines make words in any language let's go more deeply into the nature of line by using a skeleton of words.

words as skeleton

words are lines given voice

There are several ways that we can use words as skeletons. Perhaps the most obvious one is to make our composition entirely out of letters or words that may or may not actually say something that can be read. We have already explored another way – when 'writing a drawing' (*calligrams*) in **making fun of play**.

Perhaps the idea to use words to create shapes and patterns has already popped up in wondering mind. We might have discovered that we could even make forms look three-dimensional by leaving more or less space between the letters or making them thicker or thinner. In **making fun of play** we also drew pictograms, which are very literal ways of using words as a source of inspiration rather than as elements of the composition. A further possibility is to draw upon a favorite piece of literature or poetry and see how the secret senses would like to translate the beauty of the words into line. And then there is the sheer pleasure of 'wordsmithing'.

But before we explore these possibilities we need to consider how we will write our words, for we can choose from many calligraphic alternatives to form our script. And we can even make our own collection of alphabet stamps from erasers or other suitable materials. For many of the ideas in these activities I am grateful to Kent and Steward (10)

- **what kind of script?**

Try stick printing, drawn Roman, all caps, all lower case, and the charming 'amen' alphabet. Experiment with unusual tools: skewers, toothpicks, a lipstick brush, felt-tip pens ...

In **notes & anecdotes**, refer to the instructions for cutting stamps from erasers.

Make at least one full set of stamps using an existing alphabet that you like: for example, Caslon Roman, Trump Medieval Bold, or American Unical. Look at others in books on Calligraphy.

Design your own alphabet and make another full set of stamps.

Now that you know how to create the necessary technology, sink into your secret senses and take a trip backwards in time. Try to imagine yourself living at a time before the existence of any means of recording descriptions of objects, experiences or ideas by way of writing.

- **reinvent the alphabet**

How would you begin to find symbols with which you could make a written language?

Would you invent tiny diagrams, pictures?

Or would you invent marks that were signs for the sounds you made when you communicated?

Design your own written language, and make it into a set of stamps.

- **write a picture**

You can approach this from two angles. Either, you begin with a visual image that elicits a verbal response and you note those letters, words, or phrases then use them to reconstruct the image.

Or, you begin with some letters and words that you like, and play with their placement on the paper.

Why not try both? Use a combination of drawn, stamped, and collaged lettering if you like – but only use words, no pictures.

- **calligrams in code**

Try the *calligram* activity again, this time using your stamps and drawn scripts.

Use a different item, perhaps a small shell or other natural object, as your subject matter.

Invent a secret code in which to write your drawing. Play with scale and thickness of your letter lines.



- **pictograms without pictures**

Select a descriptive piece of writing from your X-file – perhaps one of the reports you wrote whilst on your research scaffolding.

Instead of translating the words into images as you did earlier, choose scripts and stamps to add qualities and moods to the words. Then arrange your 'transcribed' words on paper in a way that is relevant to the subject being described by the words.

Don't forget that you are not bound by linear placement – you can use all the space, and use it in whatever way you choose.

- **wondrous wordsmithing**

Make a list of ten words that make your mouth water.

Cut out ten words that you dislike from today's newspaper.

Cut out large colored letters from glossy magazines.

Use your drawn scripts, your alphabet stamps, the newspaper words and the big bright letters to forge a fantastic document.

Try to avoid making obvious statements. Instead, juxtapose the unusual, the surprising, and the rather outrageous.

As in the last activity, release yourself from linear placement of words – let them occupy whatever part of the paper they will, let them be upside-down, diagonal, vertical.

See them as objects in their own glorious right with their own personalities and qualities, and allow them to relate to each other in wondrous new ways.



light as scaffold

Light is the medium of visual perception, and at the same time, an object of visual perception. Light is the original split personality. Ask any quantum physicist.

- **throw some light on light**

How many different kinds of light can you find during your days and nights? How do they vary in intensity?

Make lists of keywords describing qualities of light.

hazy glaring dappled muted diaphanous ...

Revisit **wildsight – the innocent eye** and the activities in *light, lighter, lightest*. Make use of your *list of light*, and any other notes you made.

Many writers and poets talk about light and its qualities. Find three or four examples and then look for visuals that seem to express those qualities.

Match them up and put them in your X-file.

The best way to learn about the enigma of light is to design your own experiments. Does the intensity of light affect colors? Design a simple experiment to demonstrate this.

- **playing with light**

Try looking at the world through a variety of 'filters.'

Use fine muslin, colored cellophane, plastic, stained or smoky glass, or any other semi-transparent material.

How would you paint the scene surrounding you now if these filters were present? (Can you think of any artists who worked with that concept?)

Make an en-lightened shoe box. (This was one of my favorite activities as a child. I pestered everyone for shoeboxes. I even attempted to charge people money to look into what I considered to be a totally magical world within my boxes!)

Cont ...

You need a shoebox or similar, inside which you make a little theatre of precious small objects that have different colors, textures, and patterns on their surfaces.

Paint the interior of the box too, if you like. The more that's happening in there, the better!

Cut a little peep-hole in one end – just an eyeball's size.

Then cut a larger hole in the lid, perhaps 7cm x 10cm. Collect colored cellophane, and anything else that casts an interesting light. Cover the opening in the lid with these color filters, experimenting with them one by one to see what effects they create inside the box. Try different intensities of light-source too. See if you aren't enchanted!

- **patterned light**

Place some little mirrors inside your shoe box.

Notice how lines are created, accentuated, or altered by light, depending on the angle and the intensity of the light-source. Notice how shapes, and forms, and textures are accentuated or altered.

Now look for the ways these lines, shapes and forms group themselves into patterns.

Doing this might lead you to wonder about kaleidoscopes. Find out how they are made, and see if you can create one yourself.

Document your observations, for describing these phenomena sharpens one's perception of them. And you never can tell when you might need to refer to your notes, perhaps years later.

- **playing with pattern**

Set up different experiments that demonstrate the effects of 'raking' light (a very low angle). What happens to subtle surface texture?

Project light patterns onto a surface by using perforated hardboard or metal, or lines painted onto plastic or glass.

Cont ...



Look at the patterns of light themselves, independent of the object, and draw or paint them.

Hunt in books on photography for images that are composed entirely of patterns of light. You will find that this subject is a favorite preoccupation of the photographer, and you might be inspired to add the camera to your tools for exploring the light scaffold.

Make a geometric form – an icosahedron or a dodecahedron. Look at its facets under different kinds of illumination. Can you see the way the surface appears to be concave, then convex, depending upon the angle of light-source? Do you think that this is an observation that would be useful for the painter or sculptor? Can you explain why?

- **light as magician**

Qualities of light affect perception and the appearance of movement.

Think about these words:

flicker sparkle reflect shimmer project deflect flash ... Add more of your own.

Find examples of the action of light on various surfaces that fit with your word list. Try to illustrate your findings.

Make a study of one kind of natural surface that is continuously affected by the action of light, for example, clouds, or a landscape that you look at every day, or the surface of a large body of water.

Look at your subject at certain times of the day (dawn, mid-day, afternoon, dusk, twilight, evening), and write a description of what effects the light is creating at that time.

Note the changes in color, in texture, and the quality of the shadows – everything.

Do this every day for two weeks. Your findings will change the way you see your subject forever, and you will know how Claude Monet looked at and perceived his world. Look at his Haystack paintings ...



Put your findings into practice by setting up your own small magic corner of the world:

- **make an illuminarium**

How does movement of light produce optical illusions?

Think about mirages in the desert.

Find out how the colors of a sunrise or a sunset happen, and why the full moon looks so huge when it rises. And what about the Aurora Australis?

You will need a sheet of metallic foil and a white surface like a wall, or a big piece of card. Cut patterns into the foil sheet.

Arrange lighting so that the foil projects a bright image onto the white surface; then create moving, changing images by bending and rotating the foil sheet.

If you can set up a camera and have someone to help you, try to capture some of these images on film. Both the negatives and the prints will be interesting demonstrations of the action of light.

Light is surely the greatest wonder in creation. For without it we are left groping in a world unformed. Without it there are no lines to see, no shapes to behold, no perspectives to view, and no colors with which to create the world we often take for granted. Without it, how can the miracle of perception find its function? It isn't surprising that the ancients worshipped the sun, and that the mystics have always asserted that God is light.

There was every color, seen or unseen, in the valley that evening;
every color had its overtones, hidden and open,
and every leaf and every blade of rice was exploding in the delight of color.
Color was god ... *J Krishnamurti* (13)

It will come as no surprise to readers, given the writer's predilection and passion for color, that the choice inspired by exploring the scaffold of light takes us into a deeper study of color: color as skeleton, color for its own gorgeous sake.

color as skeleton

Color is the child of light. Color is pure energy. To create with color is to play with the vibratory energy of the universe.

Here's a paradox: without light there's no color, yet we can also say that color is the absence of light. Color perceived is light that is reflected and not absorbed by a surface. The different hues (green, yellow, violet, etc) are manifesting within different levels of radiation and absorption. That means that when we perceive the red hue what has happened is that all the chromatic wavelengths of the other spectral colors have been absorbed by the surface of the object, and the surface couldn't absorb the red wavelengths.

When working with hues it is always rewarding and fascinating to keep in mind that you are not working with color as such, but with wavelengths of light. And that when you put down one hue, the others are always present as well, hiding in the unseen yet able to be sensed in more subtle ways. Namgyal Rinpoche suggests that when you use a hue you should ask yourself "What color *isn't* this?" The recognition of what it isn't, is as important as recognizing what it is. (14)

One way that helps us to become very sensitive to what a hue is, and is not, is to explore the chromatic effect that takes place when all light is reflected and none absorbed. We call this hue white. There is endless subtlety in white, and one artist, Giorgio Morandi, spent the majority of his life wondering about those subtleties in uncomplicated still-life studies of simple everyday objects. Others have done the same in abstract compositions. Let's think of white as a constraint within our color skeleton.

- **white magic**

Do a group of paintings of white on white. Use acrylic paint on white canvas board that has some texture – remember that the action of light will affect the hue on a textured surface.

Begin with one egg.

Then do two eggs slightly overlapping.

Cont ...

Then do a painting of a white bowl containing many white eggs, and sitting on a crumpled white cloth.

You may add miniscule amounts of color – only a pin-point will be necessary – to assist the development of your white forms against white ground. The challenge is to create forms using only white, and to focus your perceptual muscles so sharply that you can begin to see the subtle variations that exist within the white hue.

And:

See how many varieties of white hues you can collect from magazine pages, samples of papers, paint-chip samples, textiles, and yarns. Play with them, composing a work that explores the subtleties of differences, how some recede and some advance, how they affect each other when juxtaposed, and how the whole page can 'sing' a white song.

For the seed of the following idea I thank Judith Cornell. In her book *Drawing the Light from Within* (15), she encourages students to realize the quantum qualities of the colors they work with – which is to understand them as photons of light energy. I wonder whether fully grasping the impact of that perspective – not just in the workroom, but in life as well – would radically change one's perception of color? Experiment for yourself.

- **ladder of light drawings**

Take your best *ladder of light* from **wildsight – the innocent eye**.

Take out some of your *doodle drawings* from **making fun of play** and from your work with lines earlier in this e-book. Select one you like and, if it is small, enlarge it on the photocopier.

Now, using a soft lead pencil, 'color-in' the spaces in your drawing with ladders of light. Resist the familiar – the urge to make recognizable shapes or scenes. Stay with 'doodle mind,' and explore all the different ways that ladders of light can dance within your lines, shapes, spaces.

If that was fun, try moving into color. Make a *ladder of light* with steps that go from one hue to another. (Blue to yellow for greens, etc)

Cont ...



Use your colored ladder of light to 'color-in' your doodle drawing.

From there, the possibilities are endless. Use several color ladders in a drawing. Make new drawings and utilize your ladders of light as part of the design process.

Experiment with abstract compositions or geometrical formats – look at the work of Vasarely, and the way he combines ladders of light with geometric shapes.

In **making fun of play**, we played a dice game with colors: *throw the dice*. Several variations of that game were suggested, and now that we are more familiar with some of the qualities of color – especially tones – experimenting with them again might be even more rewarding.

Here's another chance game that is fun, interesting, and has the added bonus of intimately familiarizing us with the work of a master painter. American artist and film-maker Frank Gardner once exhibited a group of works he produced in this way, using scraps of fabric as his medium. The show was called *Aleatory Works* – aleatory implies luck, or chance – as in 'the die is cast'.

- **an aleatory adventure**

Make a *ladder of light* with 24 steps including white and black.

Choose a masterwork from an artist like Vermeer, whose works are permeated with light. Buy a poster of the work.

Overlay an acetate grid of 1cm x 1cm squares.

For each square, assign a *ladder of light* value from 1 (white) to 24 (black), by holding your ladder of tones against the color within the square. Mark that number on the acetate.

Make another grid on a large piece of card that will be the 'ground' for your work.

Choose 6 differently colored fabrics and/or papers that tonally match each of the 24 steps in your ladder – 144 in total. Number them 1 – 6 for each of the 24 tonal steps.

Cont ...





The value group for each square in your grid is already marked down on the acetate sheet. All you have to do now is let the dice select which of the 6 colors to use. The dice has 6 sides, so each time it is thrown for each square of the grid, a certain fabric is selected.

Cut out the square of fabric 'chosen' by the dice, and glue it onto the card. Continue until the whole grid has been covered.

This is an excellent way to expand tonal perception, to demonstrate the effects of color juxtaposition, and as mentioned, to learn to appreciate the way a master painter manipulates light to create an illusion on a two-dimensional surface. You could use the colored papers you gathered up on the *paint chip hunt* in **wildsight – the innocent eye** for this project. Or you could be really intrepid and mix your own colors using paints, which is precisely what we'll do in the next project.

One of the most useful tools for the artist in any medium is a color wheel – a device showing the relationships between the primary, secondary, and tertiary hues laid out in a circular format. More detailed wheels also show the relationships between tones, tints, and shades. It is possible to purchase such a tool, but to make one's own offers an impressive self-education in color-mixing and theory. And if the project is combined with the motivation to make something of great beauty as well as usefulness the result will be a work of art in its own right.

- **a color compass**

A color compass is a great companion on one's journey into the world of color. Begin by researching the ways that people – scientists as well as artists – have tried to create color systems. You will find plenty of documentation about this endeavor, since it has preoccupied man since antiquity. By doing this research you will familiarize yourself with some of the challenges that face you in your simpler, yet demanding, task.

Think carefully about the design. What size? A circle less than 30cm across will be too cramped. Bigger will be better in this instance.

Take another look at your *flower of life*. Perhaps it will suggest some geometric skeletal possibilities.

Cont ...



Resist the cut pie effect by introducing curved lines and unusual divisions of circular space. But don't get so carried away that your tool is unreadable as a color reference: remember its function!

You need to include:

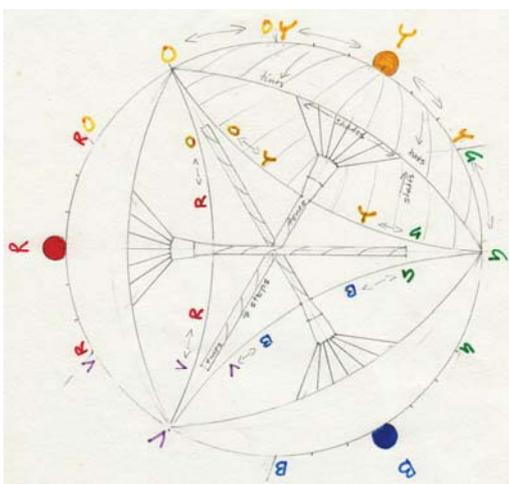
- the 3 primary hues
- the 3 secondary hues
- the 6 tertiary hues
- at least 5 tonal steps for each hue
- at least 3 tinted steps for each hue
- at least 3 shaded steps for each hue

Remember that technically, tones are formed by the addition of gray to a hue, tints by the addition of white, and shades by the addition of black.

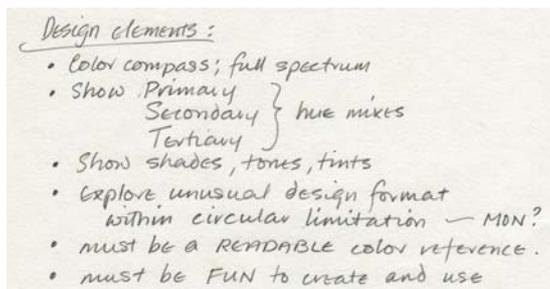
When you are satisfied with your design, mark it out on a sheet of good strong card and start playing with your pigments. (See **notes & anecdotes** for a recommended list of colors.)

You can jump in at the deep end, applying your paints directly to the card and modifying the tones as you work, or, you can save yourself much frustration and time by creating the wheel with collaged fragments of color.

To do this, you paint all your color samples onto a separate paper, putting down lots of tonal steps, tints, and shades. Then you select the swatches that make even steps, cut them out to the size of the space they will fill on your wheel, and glue them down.



Color compass ideas from X-file ...



We come to the end of another series of experiments, explorations, and questions for wondering mind. We have spent time climbing about upon our scaffolds, and building within and onto our skeletons. As we did so, we pushed the limits of our knowledge further, and widened our perceptual ability. More questions have arisen from the heights and the depths, and no doubt some of them are concerned with perspectives, for one cannot climb and burrow without realizing that the views are changing with every step.

By this stage we will have probably experienced for ourselves that a shift of perspective can open up a new vista – a new worldview. The next e-book, **outside the square**, takes us on an expedition to the heart of perceptual wonderland, where we will focus our attention on some odd and interesting ways of viewing and representing the world.

It may never look the same again.

What is so exciting is that, not infrequently, what began as an academic mental exercise, or as a dreamful expression of emotion, has determined our whole understanding of the world.
Karl Gerstner (16)

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