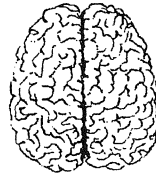


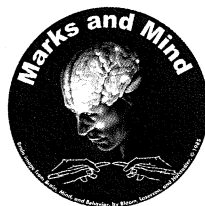
The Thinking Child
A handbook for parents

How Literacy at home starts with scribbling and drawing
The Drawing/Writing Program

by
Susan Rich Sheridan
copyright 2002



"Thinking Children," Claus Kormannshaus, 1997.



Drawing/Writing Publications

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Author with grandson, Ben, age 15 months, reading, 2002

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Dr. Sheridan's theory of education Neuroconstructivism, and her cross-modal practice Drawing/Writing are the result of twenty years of teaching and field research. For more information, visit the Drawing/Writing website: [www. drawingwriting.com](http://www.drawingwriting.com).
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**A Thumbnail Sketch of the Drawing/Writing Program:
A Handbook for Parents with Children from Birth to Six Years of Age**

Connecting a brain-based literacy program with intimacy, and intelligence at home

by Susan Rich Sheridan, Ed.D.
copyright 2002

From birth to six years of age, try the following mark-making exercises with your young children. The results will be remarkable.

Think of how quickly your baby changes and grows. Your child's brain changes and grows as quickly, and as dramatically, and, in some cases, as irreversibly. Your toddler can not go back to being a newborn. The six-year old's brain can not go back to infancy, and start all over again, unraveling damaged or tangled neural nets.

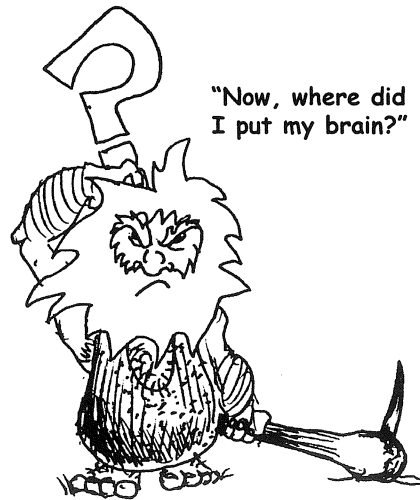
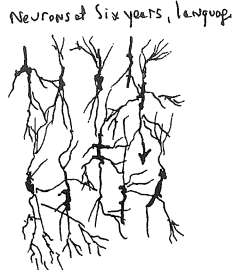


"Babies," reprinted by permission of Dover Pictorial Archive Series, © 1969 Dover Publications, Inc.

The brain is marvelously modifiable, plastic, changeable, fixable, self-repairable. It is redundant. That means the brain has more neurons than it needs. Still, brain damage resulting from neglect or abuse or over-stimulation can last a lifetime.



Newborn and six-year-old brain, SRS 97



Searching for the lost brain, Sam Sheridan, 1997

If a child does not think he can talk very well, or write or read very well, or interact very well by the time he is six, it is going to be very rough sledding to convince him in elementary school or as an adolescent or as an adult that he can do otherwise.

You want your little child to go out into the world as whole and happy and capable as possible. To be whole and happy and capable, your child needs to be able to get along with other people, your child needs to know how to use his or her brain to its own special optimum levels, and your child needs to be literate. Your child needs to be able to read and write a range of symbols including visual images and words. Otherwise, your child is at the mercy of the media and popular culture. Your child may be unable to extract enough information from text

and image to make informed, intelligent choices.

It is never too young to talk to children or to read to them and write with them. You do not ask yourself twice about chatting with your newborn. This book will show you how to chat with very young children about marks, starting with scribbles.

The returns on the investment of time and energy spent on conversations around scribbling and drawing and writing with children will be large — even huge. These returns will include feelings of closeness with your children based on the understanding we get from each other by listening, looking, and talking together. The returns will also optimize your child's intelligence in terms of observable skills, including social skills, speaking skills, and drawing, writing, and reading skills.

The theory supporting this handbook is called Neuroconstructivism. The Latin word "*neuro*" means "brain", and the verb "*construo, construere*" means "to build." It is my position as a parent, a teacher, an academic researcher, and as a scholar that mark-making builds human brains in special ways. It is also my position that mark-making begins with scribbling and that scribbling is a deeply significant event in your child's life, as important as beginning to walk or talk.

Neuroconstructivist theory and the practice called Drawing/Writing support the idea that the way children learn to think in early childhood *using marks* organizes and structures their brains for a lifetime of symbolic thinking. Symbolic thinking simply means humans think using objects which were originally marks made by our hands and seen by our eyes. This kind of thinking makes our brains different from other mammals, including other primates.

How do we know? We know because monkeys and cats and dogs and whales and ravens and



"Monkey," Claus Kormannshaus, 1997

porpoises, as intelligent as these creatures are, do not draw, or write and produce algebraic statements or compose symphonic scores. I am not saying our thinking is better. I am saying it is different. Our children are not porpoises or monkeys. They are human beings. They have human brains. Human brains have evolved to think using marks. We humans are mark-makers of significance.

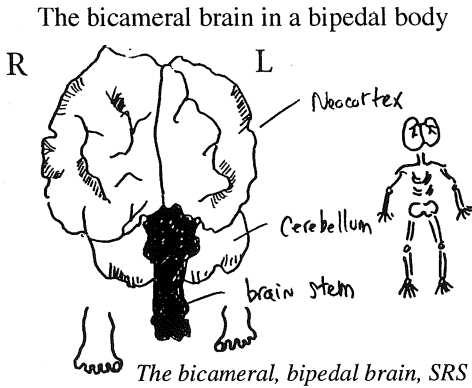
Can we change the ways we think and feel? Sometimes we can and sometimes we cannot. Basic feelings about worthiness and competence, attitudes about how we relate to other people are established in early childhood. It is this book's position that basic feelings about reading and writing are laid down in early childhood, too. This handbook shows parents how to help their children learn to read and write with skill and confidence and enjoyment and courage.



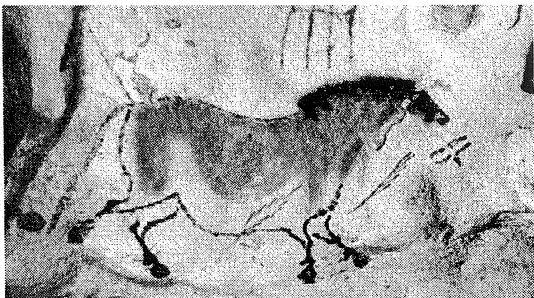
Top off the black box, Sam Sheridan, 1997

If we open the "black box" of the brain, taking a peek inside, what do we see? We see two hemispheres, two major abilities: one visual, one verbal.

Our children’s brains have evolved to write and read images, and our children’s brains have evolved to write and read words.



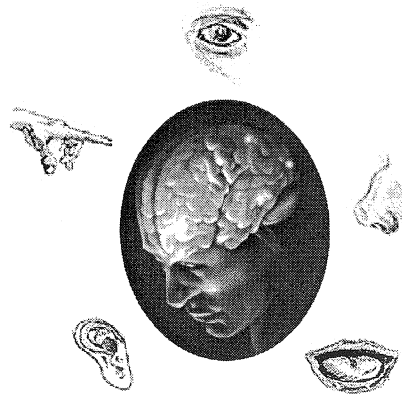
Evidence of these two major human abilities showed itself a long time ago on cave walls. In this prehistoric cave painting, we see a nicely rendered horse in profile, and a strange geometric shape hovering above it as well as several dashed lines in front of the muzzle of the horse. There are two different symbol systems in this image. One is called “representational” or “pictorial” drawing, and the other is called — something else. We do not know if cave people were using their own version of mathematics or their own version of writing, but they were using qualitatively different kinds of marks in this image. We have to conclude that the extra marks are meant to be there, and must be meant to help the viewer “read” the image.



The Chinese Horse, Lascaux, France, reprinted by permission of Yvonne Vertut, copyright by Jean Vertut. All rights reserved

What do you think the combined sets of symbols in this wall painting mean?

This handbook will show you how to help your children use all five senses, not just the visual and the verbal, to think with in the context of a range of marks so that your children can communicate with the world and, as importantly, with themselves. By helping your children think in such ways, you’ll help them build efficient, connected, multi-purpose brains. Who knows what kind of brains the future will require? At a minimum, it will require multiple literacies.



As you follow these exercises, do what you can. Your child will do what he or she can. Besides following scribbling exercises and the Drawing/Writing program with your little children, make sure to provide the following items every day of your child’s life:

1. Cuddling and other loving physical contact throughout the day.
2. Eye contact when you talk with your child and listen to your child.
3. A modulated voice, not too loud, not too soft, enunciating your words clearly, using “grown-up” words. Why waste your time and your children’s time by teaching them the briefly, rarely used language called “baby talk”?

4. A time for reading aloud daily with your children.

5) The practice of Socratic questioning, which encourages adductive reasoning.

The philosopher Socrates approached truth by asking questions. For instance, he might ask his students, "What is courage?" A student might reply, "Courage is not being afraid." Socrates would ask, "What is not being afraid?" A student might reply, "Not being afraid is fearlessness." What is fearlessness? Fearlessness is being able to act without restraint. What is restraint? Restraint is being in chains. At this point, Socratic might sum up the series of answers by saying, "So courage is being able to act without the chain-like restraints of fearfulness?" "Ad" means "to" or "toward." "Duco" means "to lead." The Socratic method of questioning leads the brain of the child on toward meaning that makes sense to the child because it is constructed by the child.

Socratic questioning helps children achieve a thoughtful, cumulative, comprehensive answer, step by step. Each answer is constructed by the questioner. Educationally, the Socratic approach guarantees what are called "student-centered" methods. At home, Socratic parenting encourages "child-centered" methods, helping children to respond without fear of being wrong.

Children need practice with thinking and exposure to words and books to care about thinking and words and books.

To care about reading, your child needs to hear and see you reading. Hold your baby in your arms while you read. Prop the book on a pillow. When your child is old enough, hold your baby on your lap while you read aloud. Let her turn the pages. Let her talk about the pictures. Let her tell you the story. Be patient. Be interested.

I still remember the day each of my children began to read, sitting on my lap. I burst into tears. *It could so easily have been otherwise.* Any one of the three could have failed to learn to read. Look at some Arabic script or some writing in Russian. Can you read it? Imagine being able to read it. What a mental event! Your little child is going to be able to do that!

It will happen all by itself. By sitting on your lap, looking at pictures and words, listening to you read words and talk about pictures, your child will learn to read. Reading is a phenomenal neural event. Think of the neurons that have to fire, the synapses that need to connect! And it takes time. Reading aloud one book to a child will not do it.

Did you perfect a skill like golf, or skiing, or basketball after just one try?

Weren't you amazed when your baby began to talk? Reading is an amazing event, too. So is writing. All three skills require adult support. A child will not learn to speak without hearing human speech. A child will not learn to read without exposure to text, nor write without exposure to an alphabet. Talking, reading and writing as relevant lifetime skills require your modeling and your genuine, invested support. Talking, reading and writing are acquired skills.

The predisposition to talk, read and write is innate, it is coded for genetically. But the gene must be, as they say, "expressed." Expression requires training of the very young child by someone who knows how to talk, read and write. Children need permission and support to read and write and think. Mark-making, on the other hand, is innate AND expresses itself. Little children scribble and draw without training by an adult.

The point at which Natural Reading and Writing give way to Training.

Reading and writing come naturally to children

at the level of scribbling and drawing. Children scribble and draw on their own, without instruction. Children can talk about their scribbles and drawings, or “read” them, without instruction. It is my conviction that children who scribble and draw and who talk about scribbles and drawings will read and write text more easily, and will tend to be lifetime readers and writers. It is also my conviction that children’s brains that are at risk for difficulties with reading and writing text and other symbols will reconfigure themselves neurally for reading and writing text and other symbols through the activities of successful, meaningful scribbling and drawing.

A home environment can nurture literacy and creative and critical thinking skills, or it can stifle them. This handbook provides a series of developmentally connected mark-making exercises for home-use. These exercises show parents how to nurture the early sparks of literacy and independent thinking at home. The additional advantages to this program of shared scribbling and drawing and writing are feelings of family connectedness.

The neuroconstructivist point of view on Socratic questioning

Allowing the child to construct a series of answers to a question allows the brain to build neural connections between ideas. Complex connections facilitate the retrieval of information in a variety of ways, as well as synthetic, or combinatorial, or creative thinking where one item triggers another item.

A Socratic, adductive approach with children does not mean that you will never explain things to children. It just means that you won’t provide your answer *first*. Ask the question, first.

“I wonder how this door knob works?”

A Neuroconstructivist point of view on literacy.

Why nurture literacy? When you boil literacy

down to its basic components, it is mark-making. Humans differ from other creatures in one very important way: they make marks of meaning. If what makes us more thoughtful than animals — able to think about the past and the future — depends, in part, on drawings and words and mathematical symbols and musical notation, then, like other important social behaviors, literacy should be encouraged at home. In fact, parents are their children’s first, best literacy teachers.

A Neuroconstructivist view on scribbling.

Your child has evolved as a mark-maker. Your child’s first, spontaneous marks are scribbles. Soon, scribbling becomes directed and intentional mark-making. Children quickly generate the entire repertoire of Euclidean and non-Euclidean geometric shapes, the same shapes used over millennia to express spiritual feelings and to decorate spiritual places, as well as those used in all kinds of geometry.

Parents need to take scribbles seriously as evidence of a brain on a new evolutionary trajectory. Our children are destined to think as mark-makers. Our children are everyday, run-of-the-mill, artists, writers, mathematicians, and musicians. Our children’s brains are designed to think visually and verbally using a range of symbols.

This being so, it makes sense to teach young children a range of symbols while encouraging children to move freely between them.

The Neuroconstructivist Fourfold Scribble Hypothesis:

- Hypothesis One: Very young children’s scribbling trains the brain to pay attention and to sustain attention, setting up a self-organizing, dyadic feedback loop between the eye/hand and the interhemispheric brain.
- Hypothesis Two: Very young children’s

scribbling stimulates individual cells and clusters of cells in the visual cortex for line and shape.


- Hypothesis Three: Very young children's scribbles help them practice and organize the shapes or patterns of thought.
- Hypothesis Four: Very young children's scribbling encourages an affinity for marks, preparing the mind for its determining behavior: literacy.

This Fourfold Scribble Hypothesis (Sheridan, 2001) predicts that young children who are encouraged to talk about their scribbles and their drawings will read more easily, will form stronger relationships with writing, will show an affinity for geometry, and, in general, will think more connectedly and unpredictably, or creatively.

Beginning Scribbling exercises. From the age when your child can scribble to two years of age.

Key to instructional icons:

 : Scribble, draw or write.

 : Peer share by showing, talking, reading aloud.

 : Build vocabulary.

Materials: paper and pencils or markers or colored pencils or crayons. Make sure the paper is as long and as wide as your child can reach.


The Activity: scribbling and talk about scribbling.

First. How to Scribble with Children from One to Two Years of Age.



Author and grandson, Ben, age 15 months old, scribbling together, 2002.

Provide your youngster with a piece of paper and a large crayon or other safe drawing tool.

 Take a piece of paper and a drawing tool yourself, and scribble. As you scribble, talk to yourself, "Now I am going up, now I am going down, I am swerving to the right, zooming to the left, softly falling to the bottom of the page. Now I am making a series of loops, over and over. My loops are getting bigger, and thicker, now thinner and smaller." This descriptive talk teaches children the formal properties of line.

These formal properties include direction, shape, texture and weight. A line can go up or down, ascend or descend, cut diagonally, sit perpendicularly, create obtuse or oblique angles, be rough or smooth, be light or heavy. Lines can create soft shapes, hard shapes. Lines can be angular and abrupt, lines can be curving and continuous, flowing or interrupted, staccato or smooth. Lines can be heavy or light, thin or thick, subtle or bold. Talk about your scribbles, and label the lines in your scribbles in these

ways. You will be teaching your child the vocabulary used in art rooms, in geometry class, in design class, in architectural programs, in art history courses.



When you finish scribbling and talking about scribbling and labeling your scribbles, write about them. Lines also carry meaning. This meaning can be emotional, narrative, informative, descriptive, predictive, hypothetical.

- Lines can be weak or strong, harsh or kind, sad or happy, calm or angry, hopeful, nervous, erratic, dependable, tentative, forthright, aggressive or passive, elated or depressed.
- Lines can suggest landscapes and animals and people and their stories.
- Lines can organize information, provide information, and refine information using graphs, pie charts, nested lists, webs, outlines.
- Lines can predict events, ask questions, speculate answers, compute amounts, relate items, create hypotheses.

What emotions do your scribbles suggest? What stories do they tell?



Peer Share with your child. Let your child go first, showing her scribble, and, if she is old enough, talking about her scribble. If she is not old enough, discuss a few of the formal elements described above. I would leave aside imaginative story-telling. That is for your child to discover.

Second.

Spontaneous Drawing. How to draw with children ages 3 to 6.



Let your child move from scribbling into other marks. Ask your child about these marks. Take notes. Become a parent-researcher on the co-development of human mark-making and

thinking skills. Is your child's brain generating mathematical marks, musical marks? Your child's talk about the marks will help you figure this out.

When your child begins to draw in the sense of trying to represent things as they look to the child, keep asking the child in an open-ended way to tell you about the drawings. Do not impose your own drawings or systems of drawing on your child. If you do, you run the risk of discouraging or intimidating your child.

Still, keep scribbling and drawing and writing near your child. Literacy is catching, like a cold.

Do not talk about your marks unless the child asks you about them. If you respond only to what your child asks, you will be sure that you are not giving the child too much information for that point in your child's mental development as a mark-maker.

Third.

The five-step Drawing/Writing program. From age 4 to 6.

Before the written word carries meaning for the child, drawings are capable of carrying information. If we connect reading and writing with children's own drawings, we'll encourage a natural unfolding of the literacy process for children. By experiencing this natural unfolding, little children will move toward the reading and writing of words in a leisurely, meaningful manner. Every step will have relevance for the child. This marks-based approach to literacy is therapeutic. It cures problems with language that spring from fearfulness and failure and simple lack of exposure before these problems can develop into full-blown deficits and destructive, constraining labeling — like ADD or LD (attention deficit disorder, or learning disabilities).

Children naturally pay attention to scribbling and

drawing. Mark-making helps little children teach themselves how to pay attention. If you want your child to be able to pay attention to marks, like words in books, you need to allow your child to self-train for attention to marks by scribbling and drawing. If your child is exposed to extensive television-watching, your child's brain is going to learn to respond to short bursts of information which are intensely visual, not verbal. If your child is moved, quickly, from event to event, your child's brain is going to learn to expect fast changes in activity and stimulation. Eventually, your child's brain is going to require short bursts of intensely visual stimulation, delivered at a certain raster rate, or oscillation rate that has been established by the television screen. Text can only seem inert, even deathly still, by comparison.

Children are active learners. They move, they explore. To expect young children to stay still to learn, to learn passively without any action on their own part, AND to be able to pay attention to marks on paper when they have been raised without marks on paper is just plain irrational. We do not expect a dog to heel if we never taught them to heel. Why do we expect our children to be able to pay attention, read and write if we never actively supported these skills when our children were young?

In the case of humans, the brain is genetically primed to self-organize on many levels, including the level of attention and the level of literacy. This means, unlike puppies, the young child is capable of self-training for attention and visual literacy as scribbling and drawing. Still, adult "training" in social interaction, including speaking, and "training" with text, or verbal literacy, is required for a child to become a successful adult in a technological, multi-media society.

Materials: legal-size paper, pencils, markers, legal-size file folders, objects of interest with dignity and power like kitchen implements and tools and bones and shells. If you child is pre-

literate, you will need a tape recorder to record the talk that accompanies the drawing.

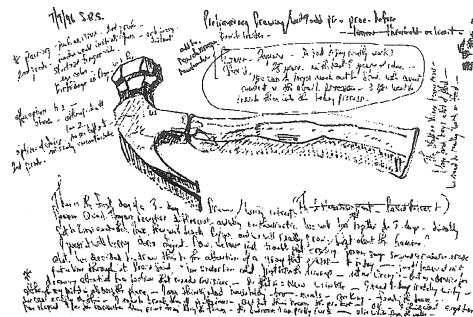
Procedure:

1) Choose an object. You will work with the same object for all five steps, practicing commitment. Get a stack of legal size paper, a set of manila legal-size folders, a range of drawing tools.


2) Set up the learning environment. Clear off a surface for drawing and writing. Turn off the TV and the computer. Make sure the space is comfy—not too warm and not too cool.

If you use background music, choose music without lyrics, and play it softly. Research tells us that music which enters both ears and which has a self-repeating, intricate pattern encourages the brain to pay attention in a mood of positive feelings. The Baroque fugue is a good example of self-calling music which models and encourages attentive activity in the brain.

**Step One:
Preliminary Drawing and Talking/Pre-writing/Writing.**



Preliminary Drawing and Writing, Hammer, SRS

 You and your child will choose a pencil or a marker to draw with, and take a piece of paper. Each of you will put the chosen object in front of you. **Draw for five minutes. Then, write for five minutes.** (Do not be upset if your

drawings do not look like mine. I have been doing this Preliminary Drawing and Writing for twenty years.)

Draw in any way you choose to. Write in any way you choose to. The child will make any marks he can at this point in his development. The child may only be able to talk about his drawing. **Record this talk** using a tape recorder so that the number and kind of spoken words can be compared with the child's talk about her drawing at the end of the exercises.

There are no rights or wrongs about how to do this drawing and writing. Do not make *any* suggestions to your child. Do *not* talk to yourself about how bad your drawing or your writing is.

KA Peer Share with your child. Let your child go first. Peer sharing means the child holds up her drawing and talks about it. Then, you get to talk about the drawing by noting areas you find successful, or appealing, *and why*. If you find an area that seems unsure or unfinished, approach that area by asking a tactful, open question. Be very careful not to be negatively critical. But do ask questions. When it comes to your own work, be critical in a matter-of-fact, backed-up way. Do not say, for instance, "My drawing is terrible." Say, "I think I could have improved this section by looking more carefully at the shape of my object."

Children need to learn to be self-critical. Unremitting praise does them no good.

A child who is led to believe that every mark he makes, every word he says, every action of his is marvelous and good is being set up for grave disappointments later in life, as well as for appearing "stuck on himself," or egotistical. Egotistical people are solitary souls.

Sample or Benchmark.

The Preliminary Drawing and Writing give you and your child a drawing and writing sample.

This sample will be compared with another drawing and writing sample at the end of these exercises. This Preliminary Drawing and Writing is a mini pre-test, but since the word "test" sounds ominous, this handbook uses the words "sample" and "benchmark" to describe this preliminary piece of mark-making work. The Preliminary Drawing and Writing only measure skills for one moment in time and space, not for a lifetime.

Step Two.

Drawing in the Air.

Stand up. Hold your object in your hands. Close your eyes. With one hand, feel your way around the object. Keeping that felt path in mind, "draw" your object in the air. Make a big drawing using your whole arm. The precedent for "Drawing in the Air" is the way Chinese children are taught to learn their characters by drawing them first in the air using large gestures.

Step Three.

Tracing/Talking/Pre-Writing/Writing.


Note: the child will either talk about their drawing or use invented spelling, or use formal writing, depending upon his or her stage of development. As the parent, you will write.

Put your object down on a piece of legal-size paper. Put the date and your name on the piece of paper. Artists and writers sign and date their work. Put the term "Tracing/Writing" on the top. You will give your work a title as a way to identify it.

Change to magic markers. You will be using magic markers until we get to The "Perfect" Whole drawing. By using markers, you and your child will be practicing risk-taking, courage and commitment.


If you used a pencil on your Preliminary Draw-


ing, ask yourself why. How is a pencil different from a marker?


 **Trace around your object.**

Now write in this manner; "My tracing of my object tells me that my object is...because..." Fill in the blanks. The line tells you that your object is curving, sharp, angular, bumpy, etc. The "because" clause forces you to explain what bumpiness is. You are going to have to describe "bumpy" in words. This explanation will refine your logic system and build your vocabulary.

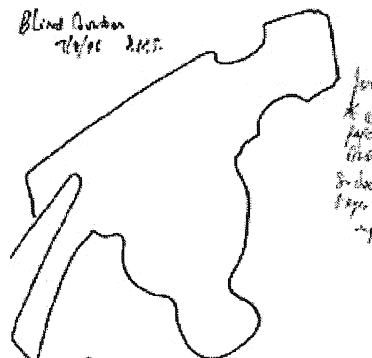
Tracing is not cheating. It is intelligent behavior. What is wrong with drawing your way around something with a mark-making tool to get an accurate copy? The young child who traces is exhibiting intelligent behavior.

 **Write:** "My tracing tells me that my object is...because..."

 **Peer Share** with your child. Let your child go first

 **Build vocabulary:** choose one word your child spoke or wrote, and put it on a list. If they are old enough to write words, ask your child to do the same. Ask you child what his word means, and write down every word he uses to explain that word. Do the same with the word of yours that he chose. In this way, a joint vocabulary is built up, exponentially, in the context of the child's own drawing and talking and writing. The child also receives the benefit of your vocabulary. Keeping a dictionary handy helps you add to your own vocabulary as well as to your child's.

Step Four Blind Contour Drawing/Writing.




My blind contour drawing tells me that my object is straight, curved, square, notched, bulbous, projecting, smooth, sharp, more of a container, more interior space

My blind contour drawing is like a heavy man child sliding down a hill.
The blind contour is a half-witted, brown nose

Blind Contour drawing, hammer, SRS

Take another sheet of paper. Continue to work with magic marker. Add your name and the date. Write the title "Blind Contour" at the top of the paper. Look at your object. Do not look at the paper. You are "blind" to the paper.

 Without looking at the paper, draw a line that goes around the object, starting at one point and not stopping until you get back to that same point. You are trying to draw a profile, or an outline of your object.

Your drawing may not come out the way you thought it would. Do not be discouraged. You are learning to see. You are learning to really look at an object as practice for looking at the world. Instead of going through life with vague and approximate ideas, you are going to train yourself and your child to see what is actually there. Because each of us sees the world differently, no two visions of the world are going to be exactly alike. But our visions need to be accurate enough

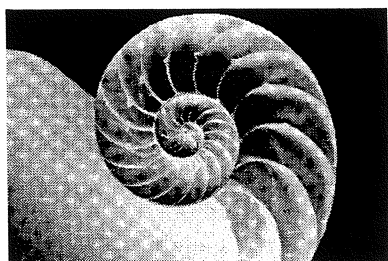
to allow us to act successfully and effectively.



Now, write, "My blind contour drawing tells me that my object is...because..."

Now add two new items, a simile and a metaphor. Simile and metaphor are both methods for comparing one thing with another thing, using words.

A simile uses the words "like" or "as": "My shell is like water going down a drain because it has a spiral construction."



Photo, Chambered Nautilus, Elizabeth Nyman, Skidmore College and Deerfield, MA, 1997

A metaphor makes a comparison *without* using the words "like" or "as." "My shell is water doing down a drain because it has a spiral construction."

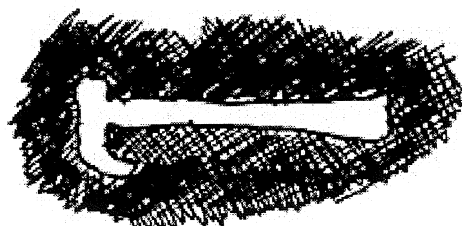
You may have to turn your drawing around and around to see something to use in your simile and metaphor. Try practicing with clouds the next time you are outside. What do they remind you of?

Simile: "My blind contour drawing looks like a ...because..."

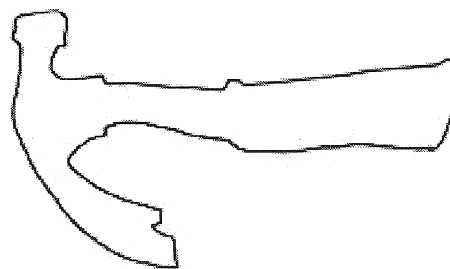
Metaphor: "My blind contour drawing is a ...because..."

Why do a contour drawing? A simple outline drawing creates a figure/ground distinction. Your

outline encloses a shape. This shape is called the figure. Everything around it is called the ground. This simple drawing is practice in choosing and isolating and focusing on one single thing.



Hammer, Figure/Ground, Negative/Positive,




Outline of hammer with blank ground around

Why write a simile and a metaphor? Simile and metaphor capitalize on similarities, or patterns which map onto each other in some way. The brain looks for patterns. Douglas Hofstadter wrote in his famous book *Gödel, Escher, Bach* that the basic question of intelligence is how things are alike and how they are different. Hofstadter was able to map the lithographs of MC Escher and the mathematics of Kurt Godel and the music of Bach as well as brain structure and function onto each other. Hofstadter has a top-level brain in terms of complex connectivity.

Which is harder to write, a simile or a metaphor? Why?

What is a simile, in your own words?

What is a metaphor, in your own words?

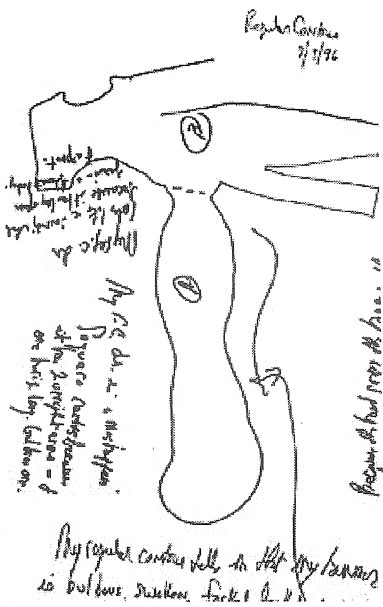
 **Peer Share with your child.** Let your child go first.



Continue to build a joint vocabulary by choosing two words your child used or wrote, putting them on a list. Ask your child to do the same, if they are old enough to write words. If they are not, model this vocabulary building strategy for them. Ask your child the meaning of each word you chose from his talking or his writing. Add these words to your list. Do the same with your own explanations of your own words. If the child is old enough to write, he writes all his extra words and all your extra words, too, by copying from your vocabulary list. If necessary, resort to the dictionary, and add those words, too.

Step Five

Regular Contour Drawing.



Regular Contour drawing, hammer SRS

Take another sheet of paper. Continue to use markers, practicing commitment and courage. Put your name and the date on the paper. Write the title "Regular Contour."



Now, do an outline drawing of your object looking at the object AND at the paper.

This way you can judge spatial relationships: how far is it from this to that on my object? You should be making some gains in terms of accuracy. Keep paying careful attention to your object. Don't draw automatically. You still have a huge amount to learn about your object.



Draw your outline slowly. Register every little in and out, every bump and curve.



Now, write, "My regular contour drawing tells me that my object is...because..."

Write a simile: "My regular contour drawing looks like a ...because..."

Write a metaphor: "My regular contour drawing is a ...because..."

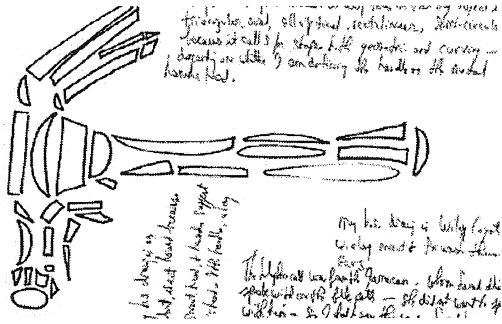


Peer Share with your child. Let your child go first



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Step Six Geometric Basic Shape Drawing/Writing: Euclidean

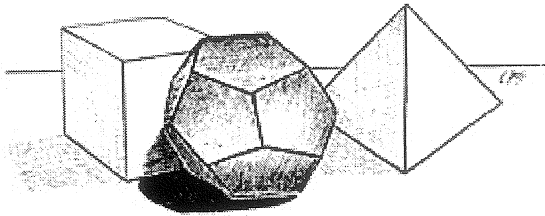


Hammer, *Euclidean Basic Shapes*, SRS, 97

Take another sheet of paper. Stay with markers. Put your name and the date on the paper.

 Write the title “Euclidean Basic Shapes Drawing/Writing.”

Why do a basic shapes drawing? Some thinkers like Plato and some artists like Cezanne believed that geometric shapes were the ultimate reality. They were the truth beneath appearances.





Cube, pyramid, dodecahedron, *Claus Kormannshaus*, 1997

Neuroconstructivist point of view: On a intercranial level, mercurial thoughts assume neurochemical shapes that are like spiraling scribbles, shapes both Euclidean and non-Euclidean. It is my belief that triangles and circles are the neural, dynamic shapes of thought, and that geometry is the first formal symbolic language of our brain, and, so, geometry as the study of shapes in space should

logically come first as a method for exploration for little children, well before the writing of words.

With this geometric drawing, you will move from the outside to the inside of your object, via imagination. You probably can not take your object apart. But you are going to think about your object as if it were built of the shapes you played with as a little child: circles, ovals, ellipses, triangles, squares, rectangles, rhombuses, trapezoids, parallelograms, pentagons, hexagons, octagons.

 Practice these shapes at the top of the page, and label them, adding the adjectives that go with them: circular, oval, elliptical, triangular.

 Write: “My Euclidean Basic Shapes drawing is circular, triangular...” (and so forth, writing down all of the adjectives that go with the shapes you’ve used).

Write: “I note that my Euclidean Basic Shapes drawing has:

- x number of circles
- y number of triangles
- (and so forth)

“These numbers tell me that my object lends itself most to triangles because...” (give the reason why triangles are appropriate shapes for describing your object.)

Write a simile: “My Euclidean Basic Shapes drawing looks like a ...because...”

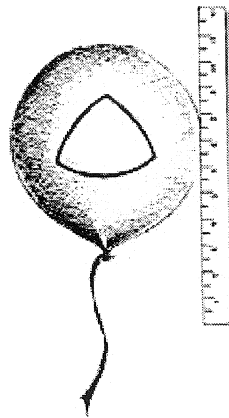
Write a metaphor: “My Euclidean Basic Shapes drawing is a ...because...”

Did you notice that many Euclidean shapes have sharp angles and straight lines? This geometry is appropriate for flat surfaces. Our world feels flat locally, and works flat locally.



Tom Sawyer painting fence, *Claus Kormannshaus*, 1997

We can build a house using straight lines and right angles. Put a ruler on a balloon. Can you measure distance on the balloon? You would need a different tool, a curving one, and a different geometry.



Balloon with triangle and ruler, Claus Kormannshaus, 1997

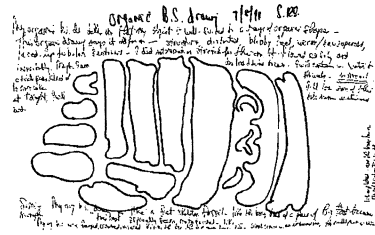
We know that our earth is curved, globally. It is a spinning ball in space. Other non-Euclidean geometries have been invented to measure and describe curved surfaces.

Peer Share with your child. Let your child go first

Build vocabulary by choosing two words your child used or wrote, and put them on a list. Ask your child to do the same, if they are old enough to write words. If they are not, model this vocabulary building strategy for them. Ask your child the meaning of each word you chose from his talking or his writing. Add these words to your list. Do the same with your own explanations of your own words. If the child is old enough to write, he writes all his extra words and all your extra words, too, by copying from your vocabulary list. If necessary, resort to the dictionary, and add those words, too.

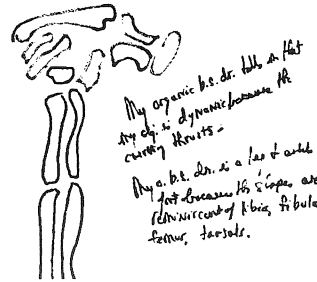
Step Seven

Geometric Basic Shapes Drawing/ Writing: Organic.



Organic Basic Shape, Lacrosse glove, SRS

7/1/96 SRS.



Organic Basic Shapes, hammer, SRS

Take another piece of paper. Put your name and the date on it. Title it "Organic Basic Shape."

Why do an Organic Shapes Drawing? Art teachers use two terms: organic and geometric. Geometric means shapes with straight lines and sharp angles. Organic means shapes that are curving and blobby. So, we do the Organic Basic Shapes drawing for contrast and variety. This drawing is freeform. It has soft edges and curves. It is biomorphic, or "life-shaped," like an amoeba. "Organic" is an adjective describing living things. Most living things do not have straight lines and sharp angles.


 Draw your object using the closed curvy


shapes you actually see in your object.

Write: "My Organic Basic Shapes drawing tells me that my object is...because..."

Simile: "My Organic Basic Shapes drawing is like a ...because..."

Metaphor: "My Organic Basic Shapes drawing is a... because..."

 **Peer Share with your child.** Let your child go first.

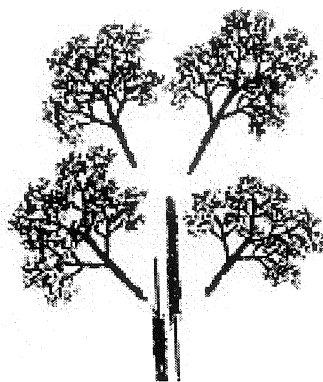
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Step Eight

Geometric Basic Shapes Drawing/ Writing: Fractal.

We are going to do a third Basic Shapes drawing. This one is titled "Fractal Basic Shapes." Take a new piece of paper. Stay with markers. Put your name and the date and this title on the paper.

Look at this computer-



A tree as copies of itself

generated drawing of a tree. A tree could be drawn by putting copies of itself together.

There is a kind of geometry called fractal geometry which describes natural things like clouds or mountains. It uses descriptive bits, the same ones, over and over, at small scales and at large scales, to build up an entire image.



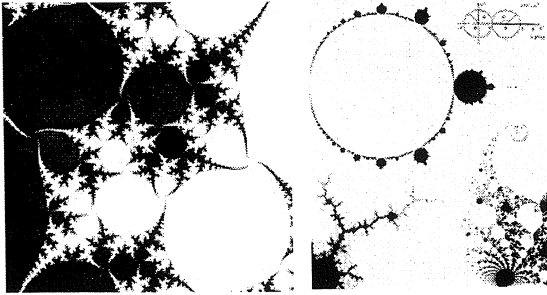
Fractal-generated landscape, from THE FRACTAL GEOMETRY OF NATURE, by Dr. Benoit B. Mandelbrot, copyright © 1977, Benoit B. Mandelbrot. Reprinted by permission of Dr. Mandelbrot

An interdisciplinary thinker named Benoit Mandelbrot discovered the relevance of a kind of strange geometry that had been around but had been called pathological, like a disease. He named it fractal geometry because it used bits, or fractions, to create wholes, and could break wholes down into fractured bits. The verb "*frango, frangere*" means "to break."

Computers have made it easy to plug in a mathematical statement, repeat it a zillion times, and watch what happens. What happens is gorgeous. Paisley shawls, seahorse coves!

The snow-flaky image on the following page is called the Mandelbrot set. See the repeating black "ladybug?" It looks the same across scales. It looks like the same ladybug whether it's big or small. Did you notice that the black ladybug is

decorated with herself? Like a fugue, like a snowflake, the ladybug is decorated with copies of itself.



The “ladybug” or “apple” in the Mandelbrot Set from *THE FRACTAL GEOMETRY OF NATURE*, by Dr. Benoit B. Mandelbrot, copyright © 1977, Benoit B. Mandelbrot. Reprinted by permission of Dr. Mandelbrot


Fractal geometry creates complex patterns by using a “seed,” then repeating the seed over and over again. In effect, the seed calls itself back, using what is called a recursive program. “Re” means “back” and “curro” means “to run.” A baby is built using a seed called DNA and a recursive program to grow a whole human being. The seed responds to the command “divide by replicating,” and then self-modifies as the embryonic mass increases, creating cells that differentiate. Fractal objects are complicated systems. The brain is a fractal object, and a fractal process, like an embryo.

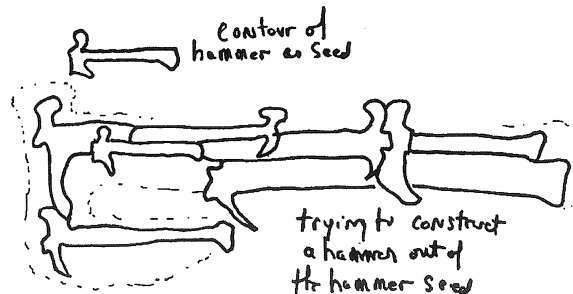
Fractals and chaos theory go together. Chaos theory says that things we used to think were indescribably messy — like mountains or trees or clouds or the weather or the stock market — actually have patterns although sometimes, as with the weather, the repeating patterns are so far apart, it’s hard to see them.

Chaos theory and fractal processes are sensitive to change. A tiny input has huge implications for the whole system. A small amount of a toxic substance, introduced at a certain time during a pregnancy, can harm the brain or body of the

baby for its lifetime. One small, new thought can change an entrenched lifetime of thinking.

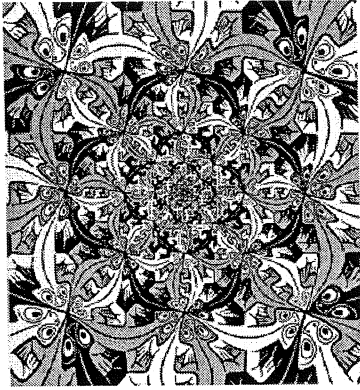
The point is, fractal geometry is relevant for our lives. That’s why, even though it’s hard using just a marker and a piece of paper and an object to achieve a fractal drawing, you and your child will practice it.

 You can try using your contour drawing as the seed. Combine that contour drawing over and over, big and small, nesting them into each other so there is no left-over space.



Fractal drawing of hammer using contour drawing of the hammer as the “seed,” SRS

Or try a basic geometric shape, like a triangle. The challenge is that you have to construct the entire object, using one “seed” that looks the same, large or small, and that fits together with no space left over. Only a few shapes “tile the plane,” or fit together without any space left over.



MC Escher, "Smaller and Smaller I"

Look at this MC Escher image. Lizards, big and small, fill the space. Doesn't this image give you a sense of an on-going, infinite process? Your brain is an on-going process, without end in this sense. Your brain is a self-correcting, self-contained system, like a tree.



Write: "My Fractal Basic Shapes drawing tells me that my object is...because..."
 Simile: My Fractal Basic Shapes drawing looks like a ...because..."
 Metaphor: My Fractal Basic Shapes. is a ...because..."



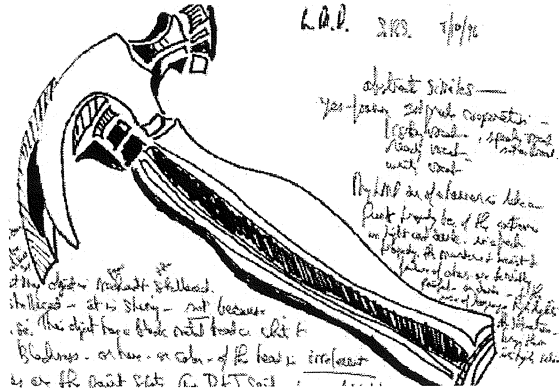
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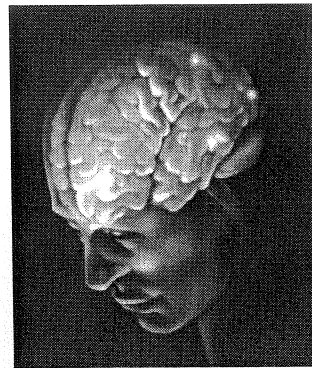
Step Nine

Light-Medium-Dark Drawing/Writing.



LMD hammer created by drawing the shapes of the light, medium, and dark areas. Correct approach to the LMD drawing.

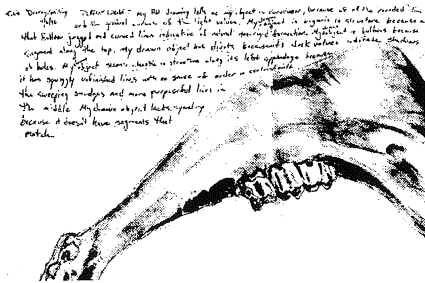
We are going to see how light hits your object, illuminating some areas, darkening others. If you can draw the lights and darks, your object is going to start looking real, as if it were three-dimensional, as if you could touch it. Look at this image of the thinking head. Why does it seem so real?



"The Thinking Brain," from *BRAIN, MIND AND BEHAVIOR*, by Bloom, Lazerson, and Hofstadter; Copyright © 1985 by Educational Broadcasting Corporation; Reprinted with permission of W. H. Freeman and Company. All rights reserved.

Take a piece of paper, stick with markers, put your name and date on the paper and add the title

“Light-Medium-Dark.” By using markers, we are not going to get a softly rendered drawing, like the one below.



“Perfect” Whole, Jawbone, Tim Lis,


We are going to get a bold value study, a study in lights and darks. Later, I will show you how to create a soft transition between values. This hard-edged drawing called LMD will get you ready for that more advanced drawing. Use shapes with no coloring in for light areas; shapes with parallel lines for middle value; shapes all colored in for dark value.

Three pattern boxes for values



The three different value patterns,

Turn off the artificial lights in the room. If possible, put your object by the window where it gets direct, natural light from one source. Squint. Try to see where your object is light, where it is middle value, and where it is dark.

 Draw the shapes of the light areas, the shapes of the middle value areas, the shapes of the dark areas as you see them. Do not draw an outline of the object and “fit” the shapes in automatically. Lights first, middle values second,

darks third. Objects are more complicated than that in most cases.

Draw the shapes of lights and darks as you see them, and let them float in space, hovering near each other.



Incorrect



Correct

Why do the LMD drawing? For one thing, rendered drawings look real. We love to produce real-looking drawings. For another, a value drawing is good training in distinguishing the obvious from the less obvious; the dramatic themes from the subtle nuances in a painting, a story, a piece of music, an everyday problem.

Think about why light behaves as it does on your object. Does the texture of the object influence light? The age of the object? The materials it is made of?



Write: “My LMD drawing tells me that my object is...because...”

Write a simile: “My LMD drawing is like a ...because...”

Write a metaphor “My LMD drawing is a ...because...”



Peer Share with your child. Let your child go first.



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Step Ten


The "Perfect" Whole Drawing/Writing.



Zoomed in "Perfect" Whole drawing, hammer, SRS

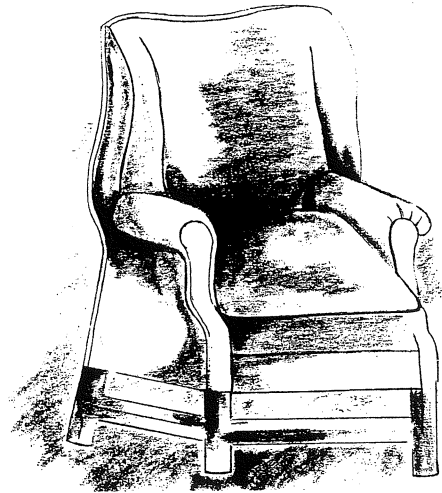
Take another piece of paper. Change to pencils. How are pencils different from markers? Do you think differently about pencils, now? Put your name and the date on the paper. Title it "The 'Perfect' Whole."

Why did I call this drawing The "Perfect" Whole, and why did I put quotation marks around the word "perfect?" The quotation marks around the word "perfect" tell us something ironic is going on. We know this drawing is not going to be perfect because no drawing can be perfect. But a drawing can be complete. It can include everything it needs to fully describe the object. It can be whole, or complete, or perfect, in that sense.

 You are going to draw for as long as you can - at least 20 minutes. Think about the contour of your object, its basic shapes, its lights and darks. Think about all of its little imperfections and details. Try to capture everything, along with the way you feel about your object. You may

decide to focus on just part of your object for the "whole" drawing.

If you want to draw the entire object, do it. If you want to select a part, and develop that part fully, do that.




Pamela Friga's chair, Continuing Education, Westfield State College, 1977

The Writing that goes with the "Perfect" Whole Drawing. Patterns for Practice.



The five sensory icons

Take a new sheet of paper. You are going to do some writing exercises called Patterns for Practice.

 Write five concrete sensory similes: A concrete simile compares the object to something you can touch, like a shell, a rock, a banana.



My object looks like...because...



My object smells like...because



My object feels like...because



My object tastes like...because



My object sounds like...because



Write five abstract sensory similes.

An abstract simile compares the object to something you can not touch, an intangible item like courage, fear, happiness, terrorism, patriotism.



My object looks like... because...



My object smells like...because



My object feels like...because



My object tastes like...because



My object sounds like...because

Now, negate your best simile:

“My object does not smell like...because...”

Observe how shooting down your own best simile forces you to be more precise, more clear.

Now, write an **analogy**. Example:

“As the claw is to my hammer, so the hooked section is to the beer can opener because the curving claw of the hammer and the hook of the opener both exert pressure which remove things like nails or bottle caps.”

Now write a **speculation**:

“My object might, could...because”

Write a **prediction**;

“My object will...because.”

Write an **hypothesis**:

“If my object.....then....because...”

Negate any of these constructions and see what happens.

Change any of these constructions from concrete to abstract. See what happens.

Why do you think the human brain invented similes, metaphors, predictions, speculations, analogies, and hypotheses?

Why do you think the human brain invented drawing and writing and mathematics and musical notation?



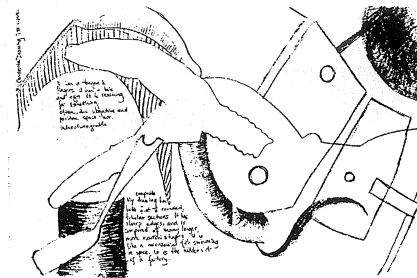
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Step Eleven

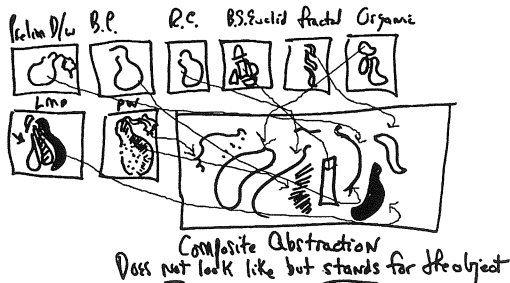
The Composite Abstraction Drawing/ Writing.



Teresa Mershon, CA, rose clippers,


Now you are ready for the final step of the Drawing/Writing program, the cognitive kicker. Take one bit from all of your other drawings and put these bits together in a new drawing which does not look like your object but which stands for object. This drawing is called the "Composite Abstraction." Use pencil or marker or pens. Anything you choose. You've earned it.

Say you were drawing a pear. The illustration below shows you how to do a composite abstraction of a pear after going through all of the steps of Drawing/Writing:



Take one part from each drawing and combine them in a new drawing.
Illustration of how to do the CA using labeled boxes.

"Co" means "together," and "pono" means "to put." "Ab" means "away from," and "traho" means "to drag." The CA is a drawing that drags certain elements away from a series of drawings and puts them together again in a new drawing. The drawing is "abstract." It does not look like the hammer. Still, it stands for the hammer. Like a word or an equation or a musical score, the CA stands for something.

 The child who can not read words yet, can read his CA drawing. The child who draws a CA has invented her own abstract symbol system. The child who has created a sign to represent meaning is writing and reading. This is hugely powerful.

Why do the CA? We do the CA with children so that they can teach themselves to read and write


by creating their own symbols, first, before they move on to anyone else's. By connecting drawing with writing, and by starting with children's self-constructed abstract symbols, we may prevent or remediate learning disabilities before they even start.

We do the CA with children so they can practice inventive or recombinant thinking, seeing what happens when they take something apart and put it back together in a new way. We also work with the CA to open discussions on ethical behavior and tolerance.

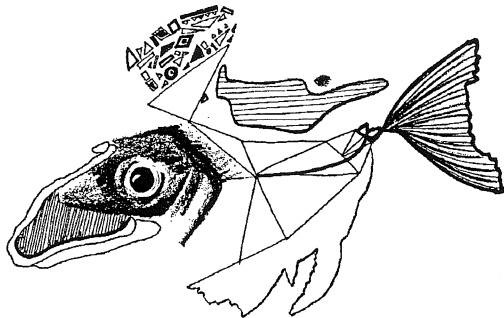
By asking children to analyze their abstract drawings for too much, and too little in terms of how they have organized marks on the paper, children start to think about right relationships in drawings. This thinking is personal. What feels right to the child is right for the child at that point in his or her development. Over time, with repeated work, the child will learn to refine drawings so that they are balanced, or "work" for the child and other people, too. We learn to relate to other human beings in the same way, over time, with repeated work in connection with appropriate, or "right" behavior.

We can also introduce the idea of acceptable differences with the CA drawing. One child's CA of a shell will be very different from another child's CA of a shell. But each child followed the rules of the program. Both drawings are equally acceptable.

Once children directly experience right relationships and acceptable differences in drawings, they can start to talk about right relationships and acceptable differences in connection with human beings.

 Write: "My CA tells me...because..."
You do not need to write about the object anymore. Just write about this abstract drawing. See where it takes you.

Referential writing, Joanne Krawczyk, fish, CA#1, CA#2, and CA#3, Continuing Education, Westfield State College, 1996



Composite Abstract I 11/9/96 JJK

Write: "This writing about the CA refers back to my object...because..." See where that takes you. I call this referential writing.

Simile: "My CA is like a...because..."

Metaphor: "My CA is a ...because..."

How and Why to do CA #2.

When a drawing has everything it requires to describe, say, a pear, it is complete. It is complete, that is, from the point of view of the one who draws it. It has neither too much, nor too little. Using this simple rule, "neither too much nor too little," makes it easy for a child to judge a drawing.

Hold up your child's first CA drawing. Ask your child to nod when he has decided where there is too much and where there is too little in the drawing. Rotate it slowly until your child nods. When the child nods, he indicates, without words, that he knows what to do with his drawing.

Have your child do the same for you with your CA#1.



You and your child will take another sheet of paper and markers and do another drawing from CA#1. Do not go back to your original stack of drawings. You and your child are refining your end products to produce a better end product.

CA#1 writing, Joanne Krawczyk, 1996

My Composite Abstract drawing tells me that my original object has exploded from a singular piece to an elaborate composition. I see a mixture of Euclidean, organic and free-formed shapes joining forces with an array of lines and values. My CA drawing would probably be classified as flat if not for the variation in size, plus overlapping lines and shapes. In a few areas, value might contribute to the illusion of a three-dimensional form. However, other areas seem to be colored in a scribbled fashion. There is one textured section on the curved piece that intersects a line jumping across the page, because it is filled with repeating lines and shapes.

My CA drawing is like a mermaid being viciously assaulted by a ravenous creature of the sea because I see her amputated body parts flailing in sky while below the open jaws of death wait to chew the bite-sized pieces.

My CA drawing is a hurricane on the turbulent sea of love because I see rigid shapes of jealousy juxtaposed with smooth forgiving forms undulating on alternating waves of distrust and desire.



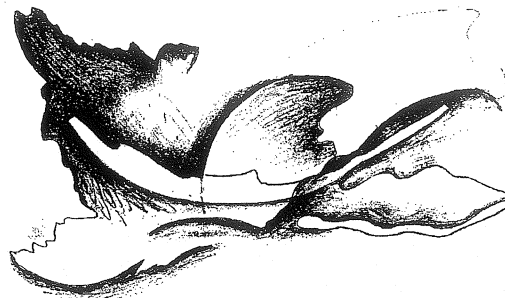
Composite Abstract II 11/14/96 JJK

CA#2 writing, Joanne Krawczyk, 1996

Compared to its earlier state, my Composite Abstract #2 drawing has been homogenized because the lines and shapes have evolved into an analogous group. All of the lines and forms are free flowing or organize in nature. A suggestion of depth occurs due to overlapping changes in value may also account for a sense of perspective.

My CA drawing is like the aftermath of a fuming tropical storm on the high seas because fins and watercraft alike are trying to balance on a topsy-turvy surf as the sun peeks over the horizon.

My CA drawing is a swimmer engaged in a butterfly stroke, moving through a billowy surface as the still shining sun drowns in the west because I see an arched figure in the foreground overlapping wavy lines and a distant circular shape.




Composite Abstract III 11/15/96 JJK

CA#3 writing, Joanne Krawczyk, 1996


My CA#1 and CA#2 tell me that the following relates to my home object: a plastic fish. I tried to distill my final CA drawing to its least common denominator and the result is a totally abstract composition. Interestingly, both of my CA writings (I and II) similes and metaphors refer to the seas and words relating to it, such as mermaid, swimmer, tropical storm, watercraft, fins, surf, high seas, butterfly stroke and creature of the sea. Although I doubt my mold-injected fish is a salt water being, a real fish would live in a watery environment.


My direct descriptions relate to my object in that they use terms like free-flowing, organic and curved which might be used to describe the characteristics of a fish or fish model.

You and your child can add one new item, but otherwise you will both be rearranging CA#1, eliminating some items, changing sizes of other items, changing relationships between items, for instance, by overlapping them.

 Write: "My CA#2 tells me...because..."
Simile "My CA#2 is like.....because..."
Metaphor: "My CA#2 is...because..."


Why do the CA#2? By learning to refine a drawing, a child gains tolerance for revision which can later be applied to writing or other mark-making systems or other products or inventions.


 **Peer Share** with your child. Let your child go first.

 **Build vocabulary** by choosing two words your child used or wrote, and put them on a list. Ask your child to do the same, if they are old enough to write words. If they are not, model this vocabulary building strategy for them. Ask your child the meaning of each word you chose from his talking or his writing. Add these words to your list. Do the same with your own explanations of your own words. If the child is old enough to write, he writes all his extra words and all your extra words, too, by copying from your vocabulary list. If necessary, resort to the dictionary, and add those words, too.

Step Twelve

Closing Drawing and Writing and How to Evaluate Changes in drawing and writing.

 Take a piece of paper. Write your name and the date on it. Take a new object. Draw it for five minutes and write about it for five minutes. Draw and write in any way you choose to.

 **Peer Share** with your child. Let your child go first.

Compare your Preliminary Drawing and Writing and your Closing Drawing and Writing in the following way:

- Start by counting words. How many words in Preliminary Writing? _____ How many in Closing Writing? _____


Did you write more or less words? What do you think writing more or less means?

- Count similes. Number in Preliminary Writing? _____ Number in Closing Writing? _____
- Count metaphors. Number in Preliminary Writing? _____ Number in Closing Writing? _____
- Count speculations (sentences that use "might," "could"). Number in Preliminary Writing? _____ Number in Closing Writing? _____
- Count predictions (sentences that use "will"). Preliminary _____ . Closing _____
- Count analogies and hypotheses. Remember that you need to use the formal construction "As A is to B, so B is to C" to qualify as an analogy. And you need to use the formal "If...then..." construction to qualify as an hypothesis.

How would you describe the changes in your writing?

Look at your Preliminary drawing and your Closing drawing. Have your drawings become more complex, more realistic, larger, stronger in lights and darks, or value? Has your drawing become simpler? How?

How would you describe the changes in your drawing?

 **Peer share** these results with your child. Let your child go first.

You will notice in the following images from the textbook *Drawing/Writing and the new literacy*, Sheridan, 1997 that Tom Sheehan used a special sheet called Rescore to evaluate his Preliminary Drawing and Writing and his Closing Drawing and Writing. You have just done this evaluation more simply.

Preliminary Drawing of Writing
9/14/96 T.W.S.



This is a drawing of a scuba mask. This mask is used for diving in the ocean.

Preliminary Drawing/Writing

Tom Sheehan, Preliminary Writing, scuba mask, 1996
"This is a drawing of a scuba mask. This mask is used for diving in the ocean."

Closing Drawing and Writing

WS
/906



When I first started drawing this new object I said this should be easy. A new object a new thing to draw and write about. So here am I babbling about nothing because I couldn't come up with anything. All I want is my scuba mask back. This new object has got me thinking. The old one was easy to write about. Everything just came to my warped mind when I was working with the scuba mask. I don't even know what you call my object.

Closing Drawing/Writing

Tom Sheehan, Closing Writing, unknown object
When I first started drawing this new object I said this should be easy. A new object a new thing to draw and write about. So here am I babbling about nothing because I couldn't come up with anything. All I want is my scuba mask back. This new object has got me thinking. The old one was easy to write about. Everything just came to my warped mind when I was working with the scuba mask. I don't even know what you call my object.

REScore student name: Tom Sheehan date: 12/14/96 In-class WORK

	PRELIMINARY DRAWING	CLOSING DRAWING
number of words	17	86
number of nouns	4	6
number of adjectives, s or v?	1	6
number of verbs, s or v?	1	6
number of adverbs	0	0
number of similes	0	1
number of metaphors	0	0
number of personifications	0	0
number of hypotheses	0	0
number of analogies	0	0
number of phrases	0	0
number of clauses	0	0
number of sentences	0	1
number of paragraphs	1	1
# of periods	0	1
# of commas	0	7
# of semi-colons	0	0
# of colons	0	0
# of dashes	0	0
# of quotation marks	0	0
# of italics	0	0
# of apostrophes	0	0

Has your writing changed? (Yes) No? (Circle one)
How has your writing changed?
Quantitative: more
Did you write more words? (Yes) No?
If you used more words, more of what kinds of words or constructions? nouns and adjectives
Qualitative: more
Did you use words better? Yes? (No)
How did you use words better? Were the nouns more unusual? Verbs or adjectives stronger? The phrases help
What part of speech did you use more? For instance, more adjectives? more nouns
What do you think this change in numbers means about your writing? It's got better
Quantitative: less
Did you write less? Yes? (No)
If less, less of what words or constructions?
Qualitative: less
Is writing less words better writing? Why?
Has drawing helped your writing? (Yes) No?
If drawing has helped, how has it helped? Lines are something to look at and it's so big.
1. Is the overall outline of your idea clearer? Yes
2. Are the basic components or "shapes" in your writing well chosen, well defined, whether these shapes are sentences, paragraphs, chapters, stanzas? Yes
3. Are there major spot-lighted ideas as well as minor ideas that are in shadow? Are there ideas hidden in shadow? Can you see the strong themes and still appreciate the lesser themes, and subtleties?
4. Does the piece of writing hold together word to word, phrase to phrase, sentence to sentence, paragraph to paragraph, chapter to chapter, unit to unit? Yes
5. Does the piece of writing make a creative leap? Does it pull or drag away certain interesting items away from the original topic and turn them into something else? If so, how did you do this? I saw drawing the mask and other ideas
6. Do you think you are gaining voice? If so, how would you define this personal style?
page-99 I notice, drift and go into my own world.

Rescore, Writing

REScore student name: Tom Sheehan date: 12/15/96

Preliminary Drawing Closing Drawing

Use of line-tentative, bold	Few lines	More lines
inaccurate, accurate		
hasty, sensitive		
few lines, many lines		
Use of shapes-geometric		
organic	both, inaccurate	many shapes, geometric
repeating	Few shapes	inaccurate
tentative, bold		
hasty, accurate		
hasty, sensitive		
few shapes, many shapes		
Use of value	strong contrast	hard-soft transition
subtle contrast, strong contrast	soft-edges transition	
few lights, mediums, darks		
many lights, mediums, darks		
soft-edged transition		
hard-edged transition		
Use of detail-few, many	Few, poorly chosen	many details
inaccurate, accurate		
poorly chosen		
well chosen		
distracting		
descriptive		
Negative space-is the space around the object thoughtfully perceived?		
Do negative and positive spaces balance each other?		

Have your drawing skills changed? Yes? (No)
Quantitative:
Are there more or less lines in the 2nd drawing? more
Are there more or less shapes in the 2nd drawing? Do the shapes combine several kinds more, yes (growth)
of geometry? What kinds? Do any shapes repeat at different scales? Is there a new
fractal element in the drawing?
Are there more or less shapes for light, medium and dark areas in the 2nd drawing? more
contrast between values? hard, strong
Are there more or less details in the second drawing? more
If there are more details, are they helpful in describing the object more fully? no
Are there more or less lines, shapes, colors overall in the 2nd drawing? more
Is there better use of space in the second drawing? no
How would you rate the first drawing in terms of realism on a scale of 1-10? 6
How would you rate the second drawing in terms of realism on a scale of 1-10? 1
Qualitative: How have your drawings changed? more sensitive
1. accuracy of contour, expressivity of contour. Are the lines stronger, surer, more
pleasing, more striking, more descriptive in an emotional way of the object? more sensitive That is,
are they more expressive? yes
2. accuracy of basic shapes, expressivity of basic shapes. Are these shapes more
descriptive of the object? Are the shapes more emotional? yes, yes
3. accuracy of values, expressivity of values. Is value handled more descriptively yes
page-100

Rescore, Drawing

Thomas Sheehan, Continuing Education, Westfield State College, 1996

Step Thirteen

Translating across more than two sign systems.

You and your child have just achieved a cross-modal translation exchange between two sign systems. Whew! Yes, you have! You have moved information from one side of your brain, from the visual side using drawing, over to the verbal side of your brain using writing. In the process, you have extended and transformed meaning. Your writing is very different from your drawing, isn't it? It does not look like your drawing and it does not *mean* exactly like your drawing.

Because the human brain has invented other marks to communicate meaning — mathematical meaning, musical meaning — it makes sense to work with these sign systems, too, and practice translating across them.

The question is, can this series of translations across sign systems be done with little children? Research is showing us that little children think mathematically. Even ducks can count (research has been done with duck hunters going into blinds and ducks not settling on ponds til every hunter has left the blind). Children do much more than that. They talk about distance, time, motion, relationships, space, shapes.

The Scribble Hypothesis makes a strong empirical argument that children's first visual, marks-based language is geometry. Children's second natural marks-based visual language is drawing, both conceptual and representational. Children draw what they know to be true as well as what they see to be true. After this, I believe children could fruitfully invent and then easily learn formal musical notation before they embark on writing. In fact, I would experiment with algebra with young children before emphasizing writing and reading words.

I believe children's early scribbles which con-

tain proto-geometric shapes *are* the actual shapes of thought on a neural level, intuited by the child through a sensory-motor feedback. I am convinced that the child's arm and eye and brain create a massive feed-back loop between brain and body when children are very young, when they are, in a sense, totally integrated. Little children are whole in intent, in action, in meaning, in emotion, in marks.

Even if I am wrong about the shapes of thought, I am not wrong about little children scribbling geometric shapes, developmentally moving from spirals to circles and then to triangles and rectangles. And I am not wrong about children drawing. They do. Children draw.

If we play with children by concentrating on mark-making, moving from scribbles into geometric shapes with talk about geometric shapes, and then into drawing with talk about drawing, and then from drawing into musical mark-making, what would be the result? What might we discover as we observe the natural unfolding of a child's marks? How could we organize that progression?

Your child's developmental mark-making trajectory, supported by your additional instruction, could look something like this: Scribble to Invented Geometry to Formal Geometry to Drawings to Invented Musical Notation to Formal Musical Notation to Algebra to Invented Spelling to Formal Spelling.

An Argument for Algebra with Very Young Children.

Note the introduction of algebra before the introduction of words in the developmental progression of marks described above. If children use the alphabet to express their thoughts algebraically first, they will not need to hook up long strings of letters. Phonics will be totally extraneous. We do not pronounce algebraic statements. In fact, the strings will be as short as three letters.

Let A = apples
Let B = sugar
Let C = applesauce

Then $A + B = C$.

If the child says, "Hey, what about heat?" then you could ask the child how to indicate that item, and the child might add:

Let H = heat.

Your child would have to invent marks to indicate the relationship of heat to sugar and apples. Being already conditioned, I might write:

$$C = H(A + B)$$

Your child will invent another way to represent this relationship.

If the child wants to specify how much heat, then she might need to learn about degrees and learn to write:

$$H = 220 \text{ degrees.}$$

She might want to specify boiling time
Then, she has to add:

$$T = \text{time.}$$

And so forth.

It does not make any difference whether you really know, as a parent, how to do algebra in any sophisticated way or not. We can all make lists like the ones above. If you and your child can deconstruct and reconstruct an activity like making applesauce and represent that activity in some way, pre-verbally, if your child is not yet writing, then you will have been successful as a proto-algebraic mark-maker.

You and your child can INVENT algebra to-

gether. If you do, then it may just be possible for your child to grow up using algebra as one of his or her everyday problem-solving languages.

Isn't this a rich way to start a relationship with the alphabet? Your child will already have absorbed the alphabet and phonemes, graphemes, and grammar and spelling on a visual/aural level by sitting on your lap for two or three years, listening to you read and watching you read and looking at books.

If you have a child with visual or aural or attentional deficits, it CAN NOT HURT to set up a routine at home with speech and marks and attentionally entrancing activities like drawing and geometry, and aurally entrancing activities like listening to and making music. Can it? It is my guess that this kind of work will remediate many learning difficulties before they have time to take serious hold.

An argument for introducing Musical Notation with Very Young Children.

Do you have to be a musician to teach yourself and your children musical notation? No, you don't. Notes that are held longer are bigger. For instance a whole note is bigger than an eighth note. A note that is higher in pitch is written higher up on the paper. Both of these visual/spatial arrangements make sense, don't they?

Get a beginner's book on music. Teach yourself the shapes. Write some music on a piece of paper. Make a pretty design. Get a friend who knows how to play the piano to play your music. Or invent a piece of music using music software, and ask the machine to play it in orchestral mode. You will be amazed with yourself.

Think how your child is going to feel when you two do this musical notation together, creating the marks that can become heard music. Fantastic!

The Visual Fugue.

I have invented a procedure for drawing a fugue, and for translating the drawings into musical notation. You might try it - it begins on page 32.

If you and your child write visual, musical, and verbal fugues, you will be thinking in brain-like, self-referential, transformative ways. This kind of translation across signs and sensory systems is optimal training for a multi-literate brain. It is what the human brain has evolved to do, but to do such work requires support, exposure and practice.

Closure:

Exercises in translating across sign systems using your CA#2.

Take your CA#2. Look over the drawing and the writing.



Translate the drawing or the writing into an algebraic statement.

Translate the algebraic statement into a musical statement.

Play the musical statement.

Translate the musical statement into a mathematical statement using numbers or graphs or calculus (if you know calculus). Translate the mathematics into writing.

Have someone read your writing aloud and do a dance to it.

Have someone tape your dancing, Watch the tape and make whatever marks occur to you.

Reflect on those marks by talking and writing about them.

Translating across systems of representation (Sheridan, 1990, 1997) will become a standard classroom strategy when education accepts the fact that media literacy, or information literacy is the key to success in a technological society. My term for describing media literacy and information literacy is multiple literacies. As parents, you can provide early training in multiple literacies as family fun.

Conclusion

The Multi-literate Child

If you work with this program with your child, your child will be multi-literate. She will be able to draw and write and she will be familiar with mathematical notation and musical notation. Being familiar with these mark-making systems, she will begin to think like an artist, a writer, a mathematician and a musician.

Your child will be fully using her bi-hemispheric brain. She will be able to communicate using multiple literacies. So will you. You'll be a multiliterate, bihemispheric parent.

Why it is important to train children to draw besides just letting them do it.

Children naturally use drawing as a way to show themselves and others what they know. Children can learn the grammar and syntax of drawing — the tricks of the trade which I have outlined in the D/W program — just the way they learn the grammar and syntax of writing, and more easily. We can use training in the grammar and syntax of drawing to help children learn to write and read words more easily, more skillfully and with more pleasure. They will understand that mark making includes learnable systems available to them with a bit of practice.

Expressing information across sign systems is part of mathematics education. Many mathematics students



"The sliding cube on a wire," Julian Fleron, Mathematics professor, Westfield State College, with his models of calculus functions, photo SR Sheridan, 1996

learn to express problems using words, numbers, graphs, equations and pictures. My former colleague and friend, mathematics professor Julian Fleron of Westfield State College, added a fifth item to that set of systems: 3-dimensional modeling.

You could try this, too, with your children. Take one of your mark-making statements and turn it into a three-dimensional model or a sculpture. Art history shows us that humankind sculpted first and drew second. Developmentally, little children build towers with blocks before they draw or write. Since this book starts with scribbles, we will start with mark-making and culminate with sculpture.

Translating information from one set of sensory inputs to another — from what something looks like to what it sounds like, for instance — is what brains do. When a brain is aware of this process, the translation is called synaesthesia. For instance, Wassily Kandinsky, the abstract expressionist artist, saw color and heard music. As a child, he played the violin. He was a musician *and* an artist. His brain was trained in both disciplines. Most brains do not do this kind of translation because they are not sufficiently trained, or tuned, to the wavelengths, say, of color, and to the wavelengths of sound so that their brains automatically map color onto sound and vice versa. If we all sensitize our brains to sounds and colors and nuances in words and images, we will indeed be using our sensory systems intelligently, able to achieve this cross-modal mapping or cross-modal translations, easily and routinely, as a rich, natural way to think as a human being.

Summing Up

If we want to devise brain compatible literacy education at home or at school, we need to accept two facts about the design of the human brain:

- The human brain is designed for multiple literacies

- The human brain is designed to translate information across systems of representation using a range of marks or signs or symbols including drawing, writing, mathematics and musical notation.

New mytho-poetic rituals

Teacher workshops often have little effect on teachers. Repeated activities change how people think and teach. Repeated activities help us learn.

A friend recently observed, “We need mytho-poetic rituals in our lives.” I agree! We need repeated activities to lift and inspire our hearts and minds.

This book presents a simple set of rituals for parents and their children centered around talk and mark-making designed to lift our hearts and minds in the very process of encouraging special human behaviors which only flourish and deepen and grow with use: talking, drawing, reading, writing, thinking.

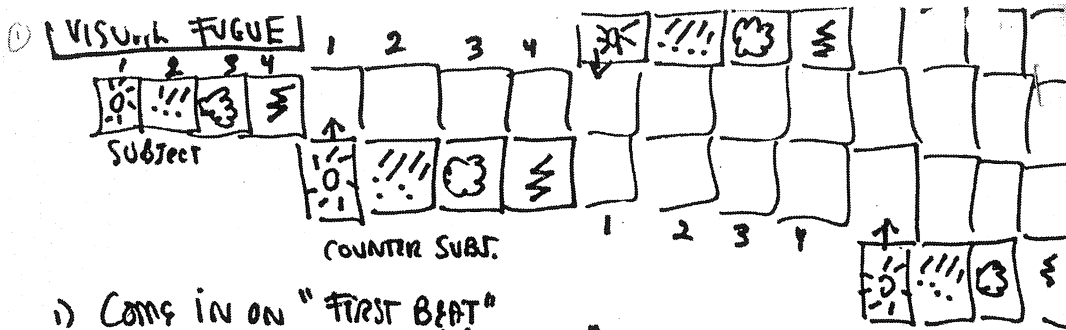
The Thinking Child can be our new hero. The Thinking Child is you, it is me, it is our children.

Marks of meaning can return the poetry to our lives.

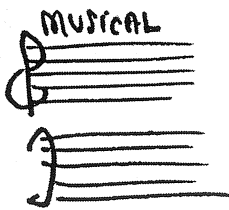


“Thinking Children,” Claus Kormannshaus, 1997.

So, we have it, a new mytho-poetic set of rituals based on what we know about the young human brain, as well as what we recognize as requirements for success in adult human society at this point in human evolutionary history.



- 1) COMP IN ON "FIRST BEAT"
- 2) BOX ABOVE or BELOW $\begin{matrix} \circ \\ \cdot \\ \cdot \\ \cdot \end{matrix}$ CAN "NOT GO" - \rightarrow DISSONANT
- 3) BOX ABOVE or BELOW $\begin{matrix} \circ \\ \cdot \\ \cdot \\ \cdot \end{matrix}$ CAN "NOT GO" - \rightarrow DISSONANT
- 4) RESOLVE DISSONANCE ON 2nd or 4th "BEAT"



MUSICAL $\frac{4}{4}$ TIME

- 1) 4 BEATS MEASURE - BEGIN & END ON C
- 2) 3rd & 5th $\left\{ \begin{matrix} \text{MATCH} - \text{CONSONANT} \\ \text{6^{th}} \\ \text{OCTAVES} \end{matrix} \right.$

- 3) 2nd, 7th, 9th, 11th, 13th DO NOT MATCH - DISSONANT
- 4) RESOLVE DISSONANCE ON 1st or 3rd BEAT ON (2nd) or (4th)

START EACH NEW VOICE 5 NOTES ABOVE or 4 BELOW

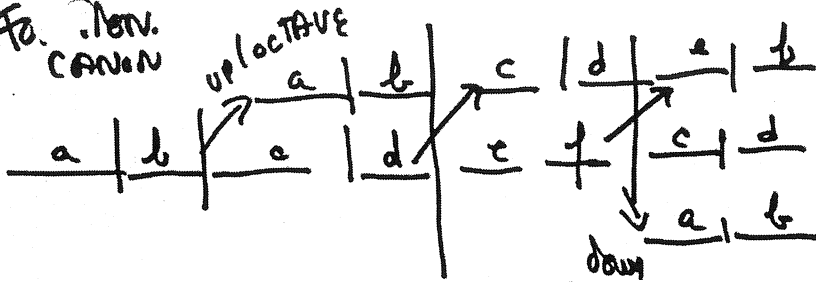
② MUSICAL FUGUE

FILL IN MEASURES ABOVE - & SOLON.

CRAB CANON = SUBJECT BACKWARD -



8 Fo. Nov. CANON



8 measures.

Resolve: consonances 1st, 3rd, 5th 8th OK
 DISJONANCES: 2 → 3; 4 → 5; 6 → 7 → 8
 ↓ 1 ↓ 3 ↓ 5

