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# Thinking through the box: the art teacher's role in setting ideationally generative assignment parameters, and expanding students' problem-finding strategies

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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

THINKING THROUGH THE BOX: THE ART TEACHER'S ROLE IN SETTING  
IDEATIONALLY GENERATIVE ASSIGNMENT PARAMETERS, AND  
EXPANDING STUDENTS' PROBLEM-FINDING STRATEGIES

A Thesis  
Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Master of Arts

Brad James Conklin

College of Performing and Visual Arts  
School of Art and Design  
Program of Art Education

May 2013

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This Thesis by: Brad James Conklin

Entitled: *Thinking Through the Box: The Art Teacher's Role in Setting Ideationally Generative Assignment Parameters, and Expanding Students' Problem-Finding Strategies*

has been approved as meeting the requirement for the Degree of Master of Arts in College of Performing and Visual Arts in School of Art and Design, Program of Art Education

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## ABSTRACT

Conklin, Brad. *Thinking Through the Box: The Art Teacher's Role in Setting Ideationally Generative Assignment Parameters, and Expanding Students' Problem-Finding Strategies*. Unpublished Master of Arts thesis, University of Northern Colorado, 2013.

This thesis explores the nature of generative parameters, and their present – as well as their much greater potential – function in visual art assignments. An effort of thoughtful self-study, it examines important questions that were revealed during the teaching of a fifth grade art unit. Collaboration and chance were used in that unit as productive constraints. Bringing together insights gathered from a number of sources and my own classroom action research, a theory of teaching for creative behavior is offered with suggestions for good practices in the art room.

Promoting creative thinking in the art classroom does not require that students have *complete* freedom. Actually, the parameters or constraints that the art teacher imposes on students' artmaking helps to focus their efforts and can lead to creative breakthroughs. The goal is that students progressively develop their own aesthetic preferences and self-impose constraints on their art. Artists must create their own problems to solve; the learning of problem-finding behavior is a major educational necessity beneficial to artmaking and nearly every other mode of human inquiry. The components of problem theory are discussed (problem identification, problem finding, and problem solving). Various conceptions of creativity are examined; most importantly, creativity as synthesis. Special attention is given to the implications of cognitive theory,

stream of consciousness, synectics, randomization, exercises in empathy, analogies, and other methods of ideation for the generation of novel ideas. Elements of arousal theory, the structure of memory, and phenomenology are also referenced. Connections are made to the philosophies and techniques of prominent art figures, both historical and contemporary.

## **DEDICATION**

This thesis is dedicated to all of my art teachers – many of whom posed great questions, and assigned challenging visual and expressive problems.

I wish to thank the professors who served on my thesis committee for their continued support as I endeavored to write a document with personal meaning and public applicability. Many of their teachings have influenced the ideas presented here. Much gratitude is owed to my parents, William and Maria Conklin, Jr., and my fiancée, April; without their unwavering encouragement, this document would not have been possible.

## TABLE OF CONTENTS

CHAPTER		
I.	INTRODUCTION .....	1
II.	QUESTIONS EMERGE: THE CHIMERA ART UNIT .....	9
	Methodology Narrative .....	9
	Purpose .....	9
	Procedure .....	13
	Data Collection and Results .....	14
	Discussion .....	15
	Moving Forward .....	20
III.	RECONSIDERING CREATIVITY .....	21
	The Invisible Word: Creativity .....	21
	Talent and Intelligence .....	23
	Revealing the Inner Self .....	27
	New Syntheses .....	30
	Bracketing .....	35
	Introducing a Creativity Curriculum .....	38
	Parameters .....	41
	Types of Constraints .....	44
	“The Box” .....	50
	Ownership of Parameters .....	52
IV.	THE NATURE OF PROBLEMS .....	56
	Problem Theory .....	56
	The Structure of Problems .....	57
	Productive and Reproductive Thinking .....	63
	Problem-Based Learning .....	65
	Arousal and Motivation .....	70
	Problem Finding .....	73
V.	THE ORIGINS OF IDEAS .....	84
	Cognition .....	84
	Ideation .....	90
	Tools for Creative Imagination .....	93
	Domain Constraints .....	93



Phenomenology .....	99
Memory and Passive Knowledge .....	101
Free Association and Stream of Consciousness .....	105
Synectics and Lateral Thinking .....	106
Strange Analogies and Force Fit .....	107
Synesthesia .....	109
Verbs .....	110
New Perspectives and Reconsidering Assumptions .....	111
Empathy .....	112
Surrealism .....	113
Seeing Into .....	114
Unconscious Processing .....	114
Chance Procedures .....	115
VI. CONCLUSION .....	117
REFERENCES .....	121
APPENDIX	
A CHIMERA UNIT: IDEATION WORKSHEETS .....	125
B CHIMERA UNIT: DETAILED TEACHING PROCEDURE .....	132
C CHIMERA UNIT: MORE REFLECTION .....	138
D CHIMERA UNIT: ASSESSMENT RUBRIC .....	141

## LIST OF FIGURES

### FIGURE

1	Chimera Unit Student Work .....	16
2	Example of Chimera Unit Thumbnail Exploration Sketching .....	19
3	Bloom's Taxonomy (Original and Updated) .....	30
4	Synectics/Phenomenological Bracketing Exercise .....	36
5	The Bottleneck as a Model for Productive Constraints .....	42
6	Stretching the Box .....	51
7	The Essentials of Problem Space .....	57
8	Simplified Graph of Artmaking Time Used for Problem Finding ....	82
9	The Filtering of Unconscious Thoughts .....	91
10	Chimera Unit Teaching Visuals .....	134
11	Teaching Sample: Chimera Painting and Narrative .....	136

## CHAPTER I

### INTRODUCTION

*“Innovation is born from the interaction between constraint and vision”*  
(Mayer, 2006, para. 8).

The human mind is innately inquisitive, probing, searching. We seek answers to questions large and small. Most of the time, the “answers” we find lead to further questions. Without our nature for question posing, what would happen to the driving force behind human innovation and advancement? What would motivate individuals to stretch beyond their current understandings to that next opportunity for growth? Questions guide and direct our activities. Without them, we do not move forward. Without – what we will later term – *productive questions*, we remain where and what we currently are. Productive questions have a special place in the classroom.

This self-reflective work was the product of many years of quiet, perhaps subconscious gestation and rumination during my art and art education training. At the time of its writing, it was a figurative semicolon separating what I knew about art education from what I did not know, from what I had done from what I hoped to do. Only just prior to my research for this project, while reflecting on my artmaking experiences, did I discover – or rediscover – the earliest starting sparks of the questions I sought to investigate in earnest. The writing of this document was an in-depth exercise in metacognition, a form of personal research expanded to benefit others. Reflection propelled my search for a comprehensive network of understanding that would include my personal life experiences with creative activity, and my development as an art

educator. Important memories surfaced, threads of interconnectedness become more visible, and a trajectory for my teaching intentions began materializing.

Looking back, I remember being introduced to the processes of free association, brainstorming (mind mapping), and synectics, as well as aleatoric music early in college. Five of my professors provided carefully designed questions or parameters (we will explore the term later in this writing) to direct my focus and encourage innovative solutions. These same professors imposed certain material or conceptual limitations on my artistic responses and those of my colleagues. I enjoyed the challenge of resolving the meeting place between my background, my idiosyncratic sensibilities – my aesthetic – and the constraints of the posed problem(s). It is my wish to create similar problem-solving situations for my future students – fifth grade through twelfth – with appropriate degree of difficulty and scaffolding. The lesson included as part of this study was taught to fifth graders at an elementary school. I have the added perspective on the application of college-level art assignment constraints from my experiences as a student. Considering the combination of those two points of experience, I will comment on the use of generative parameters in the age range previously mentioned: fifth through twelfth. Following further teaching and research, I will be able to discuss the use of teacher-set multi-level constraints with students kindergarten through fourth grade.

Within the mechanisms, procedures, and expectations of the school environment, teacher-created parameters have validity. But, what does a student do post-schooling, without the structure of *teacher* direction? How can I, as a teacher, facilitate the students taking this “training” in ideation and problem solving and applying it to their daily lives in all the possible ways it can be applied? Later, we will discuss the importance of taking

a new perspective on old problems, of strategically selecting a different lens with which to *see* what needs to be done, and how those things might be accomplished. Also important to mention is the setting up of more and more choice-based art education programs in the state of Colorado, and across the nation. What sort of presence should a teacher in a choice-based classroom have? Is he/she primarily a facilitator of material and techniques? Or is it productive for the teacher to set loose theme, concept, or media restrictions to help focus the students' self-directed work? Perhaps the constraints must always be individualized, making the job of the art teacher that much more invaluable. These questions regarding choice-based art rooms will need to be examined at another time.

When I was in fourth grade, I began a fascination with puzzles – moving from thousand-piece jigsaw puzzles to sculptural puzzles, and even later to creating beautiful geometric polyhedra. My father and I have shared a fascination with human ingenuity and invention since I was finishing my years in elementary school. I still remember his stories about the first appearances of humankind and the leaps in our collective potential spurred by great ideas; ideas that many would say came from special “geniuses.” Where do these great questions and answers come from? This is a question that innumerable people have asked, and, for which, there may never be a neat, universally applicable answer. I by no means aim to answer such a query; I do, however, propose that creative thinking benefits from restrictions (either imposed by others or self-imposed), and the embracing of that which is called random or irrational. Control must be relinquished and reasserted in a complex interplay of creation and destruction. The term *creativity* has become veiled in abstractness: it is used by so many people, agencies, organizations,

companies and task forces for a multitude of purposes, and as support for sometimes conflicting agendas. The term seems to have lost some of its potency and meaning. *Creativity* must be redefined for one's self. This is vital for those individuals who are especially fond of the notion of bringing forth original ideas. I define the word for myself in Chapter III.

One might guess already that art is extremely important to me, but what I particularly value is the thinking *behind* and *around* art. *Thinking*, of course, relates to many psychological and physiological theories, but my beliefs mesh best with the study of cognition. A personally influential college professor introduced me to cognitive science during my sophomore year in college when I took two of her courses: Advanced Composition and Cognition and Creativity. I studied the cognitive activity of artist and art audience, such as the intentional structuring of writing and narrative to achieve affective experiences in readers. As part of my coursework, I considered possible evidence for reflective and creative – and therefore conscious – artistically inclined animals, namely apes, elephants, dolphins, and chimpanzees.

After graduating with a BFA, I moved to Colorado and began exploring the next steps of my life. I was thrilled to find a graduate program, faculty, and newly developed set of state art education standards that supported my belief that artmaking *is* evidence of mind. Cognitively, I can think of few other activities that engage the mind so naturally and comprehensively. If the mind consists of incredibly complex networks of memories and concepts, then surely art – with all of its conceptual, emotional, historical, contemporary, visual, literary, mathematical, scientific, experimental, analytical, kinesthetic, technical, and intuitive facets – allows for simultaneous activation of many

areas of the mind that are usually kept separate and employed nearly singularly. There seems to be an increasing nation-wide desire to make art more cognitively substantiated. We must “dispel the idea that the arts are somehow intellectually undemanding, emotive rather than reflective operations done with the hand somehow unattached to the head” (Eisner, 2002, p. xi). And when I say *cognitively substantiated*, I do not mean that the value of art must be justified in terms of its support of the core subjects. Again, to tie in Eisner, “the arts have [their own] distinctive contributions to make. . . . [Art] experiences . . . are treasured for their intrinsic value” (2002, p. xii).

It was during my graduate coursework that I gained further understanding of phenomenology, or the study of phenomena. This reclaiming of raw sense data and the primacy of experience can be connected to cognition theory. Cognition deals fundamentally with the transformation of sense data into perceptions, and then into schemata, or conceptual organization structures (Woolfolk, 2008, pp. 279-288). Educational Psychology was another course that I found very relevant to my personal interests. In the class Art for the Exceptional Student, I found an article on Lowenfeldian questioning for children, which described a method to help students recall idiosyncratic memories of personal experiences to use in their art. All of these pieces of information and influential experiences became part of the constellation of my teaching philosophy.

There is one more piece of course experience that I appreciated greatly. Contemporary Art deepened my understanding of the many contemporary art practices, some of which have their origins in Dadaism and Surrealism: the emphasis on the seemingly random juxtaposition, the unconscious and subconscious, the automatic and chaotic, and the nonsensical. The course helped me bridge many of the methods and

motivations of the professional artist and possible teaching processes. When researching an artwork or artist, it is most useful to read about the artist's thought processes and influences. Interviews, and writings by the artist can be extremely revealing. In Chapter V, the illuminating practices of Frank Gehry, Ron Howard, Edgar Allen Poe, Jasper Johns, David Bowie, and others are described.

A thought has had a stubborn presence in my mind lately: what should an art teacher really teach? Giving thorough instruction in materials and techniques, and requiring plenty of practice to develop skills are surely useful. The majority of my early art education consisted of that type of lesson design. Only when I was transitioning into college did I begin to feel the real conceptual *work* of the artist. Every class required a steady flow of "original" ideas, and there were many classes. Also, as I progressed into the upper levels of my major area of study, some courses were setup like independent studies and seminars. In those cases, one was required to find personally meaningful questions to explore, which were subsequently laid out in a student-generated proposal/contract. As mentioned earlier, the artist post-schooling is left to find his/her own ideas, to generate "original" thoughts in relative isolation. This hard adjustment does not just happen to art majors; every student experiences the anxiety of non-structure to some extent. I have decided that the extra high anxiety level for art students arises from the virtual limitlessness of the activity – decidedly so in our current era of pluralism where anything and everything is open to artistic investigation. One can adopt and expand on traditional media and formats, or borrow from other areas of knowledge (i.e. cartography or Antarctic core sampling) and appropriate those things as *art*. The window of what can be considered art is actually not a window at all. So vast, it can only be



contained by the criteria one places on it. A more useful metaphor would be the lens. A lens is moved – it is directed and focused – by a conscious mind for the purpose of enhanced vision.

The title of this thesis plays on the somewhat hackneyed phrase “Thinking outside of the box.” Again, like the term *creativity*, *thinking outside the box* has accumulated a basic meaning that is widely understood (or misunderstood). But, digging deeper into the meaning of the phrase, one is left lost in the *product*-oriented nature of the expression. Novel ideas, at least in our fast-moving society, are, of course, highly valued. The *what* and the *why* of originality is clear. What is not, however, is the *how*. If the *box* represents a problem, then *thinking outside of the box* negates the importance of the problem. As we will soon cover, the value of finding a problem cannot be overestimated. The box is really the lens through which one views the situation. The lens provides perspective. With the exception of accidental discovery, one must look *for* something to find it. Instead of stigmatizing, discarding, or ignoring “the box,” the design of the box should be fine-tuned and appreciated for the breakthroughs it can bring about for the open-minded participant in the problem solving process.

The main mission of this thesis was to assist me in clarifying my thoughts, getting a hold on the current relevant research, analyzing one of my lessons in light of said reflection and research, and beginning to formulate ideational techniques and an understanding of generative constraints as they may best be used in the art room. To state it more directly: to become a better art teacher who structures lessons to bring out and fully support students’ individual problem-finding behavior; to move from the intensely theoretical to some practical, executable approaches to creativity building. A

long-term goal of my teaching practice has also emerged: to teach students to be brave with their “strange” ideas in the face of conformity; those strange ideas are the key to innovation.

The following questions guided my reflection on my teaching:

- Q1 What can I learn from my own artmaking experiences in school/college, and the design of the *problems* I was assigned?
- Q2 What can cognitive theory teach me about how to setup art lessons?
- Q3 What has been written and investigated about *problem-finding*?
- Q4 Has research on problem-finding been applied to art specifically?
- Q5 What *type* of problem is artmaking? How is it different from other types of problems people encounter?
- Q6 What kinds of teacher-posed parameters are most generative for students fifth through twelfth grade? Material (size, palette, source, process)? Conceptual (theme, purpose, etc.)? Both?
- Q7 Are there ideational processes that utilize randomization?
- Q8 Are there professional artists who use, or have used, creativity *strategies*?
- Q9 How does required collaboration function as a generative constraint?
- Q10 When and how is it most useful to open a problem up to student choice and input?
- Q11 How does a choice-based art teacher guide his/her students’ conceptual and expressive growth while simultaneously preserving a high level of freedom?
- Q12 How does an art teacher structure the phasing out of his/her direct influence on the students’ problem-finding efforts?

## CHAPTER II

### QUESTIONS EMERGE: THE CHIMERA ART UNIT

#### **Methodology Narrative**

##### **Purpose**

The art unit, *Chimera*, was taught in a Colorado school to a population of 84 fifth grade students (I presume between the ages of nine and eleven) divided into four classes of approximately twenty-one students. The unit was intended as a study for the improvement of my own teaching practice. *Chimera* was designed to create a complex problem-solving situation for fifth grade students – organized in groups of two to three students – to “solve.” *The Chimera* was a mythological, fire-breathing monster, commonly represented with a lion's head, a goat's body, and a serpent's tail. The word *chimera* has a broader meaning today, and can refer to any creature having disparate parts. Mythical creatures emerge from the imagination, but are anchored in familiar life experience, and are usually formed when discrete, namable features are combined in excitingly uncommon ways. The syntheses of the Greeks reinforced the value of the students' syntheses. Not only was the process important, which will be explained soon, but also the link to human ideas from a time long past.

A die was rolled to introduce chance into the ideation (or brainstorming) phase of the project. This was one “constraint” within which the students had to work. The other

major parameter was the required cooperative/collaborative nature of the assignment. The following questions guided the development of the *Chimera* lessons:

- What kinds of teacher-posed art project parameters are most generative for students in fifth grade? Material (size, restricted palette of color, source, process)? Conceptual (theme, purpose, etc.)? Both?
- How does collaboration function as a generative artmaking constraint for fifth grade students? How would students feel during and after participation in such a collaborative art activity?
- Could a die (for randomization) be used to generate a list of ideas, and, ultimately a problem of reconciling the very different elements on the list into a cohesive whole? Would students react positively or negatively to this process?

As we will discuss in Chapters III and IV, the art teacher sets limits (intentionally and unintentionally) on his/her assignments. The order of the elements within his/her presentation of the assignment, his/her word choices, and/or his/her selection of examples that “frame” the activity all affect the students’ solution outcomes. Professional artists, writers, and scientists (to name a few professions of many) are rarely, if ever, *given* problems to investigate. These individuals must usually *find* their own questions to “answer,” or purposefully create problems for themselves by self-imposing unique constraints or parameters on their activities. The ultimate goal is to add these strategies to *every* student’s repertoire of creativity tools. In the interest of building a better understanding of the creative behaviors, attitudes, and growth opportunities for young children (and, by extension, other age groups), it is important to “test” teaching techniques that aim to directly encourage creative thinking. And reflection on these educational experiments can create the desired generalizable, transferable knowledge that can be applied to areas of human activity beyond artmaking. The new Colorado Academic Standards target the cognitive aspects of creating art. *Chimera* sought to

engage students with higher-order thinking (problem-finding, decision making, consideration of many alternatives, planning, reflection) in nearly all of its lesson components. I taught the *Chimera* unit to teach students some creative and critical thinking skills they can use in their daily lives. I wanted to teach them new *approaches* to thinking about what creative people do on a regular basis, and practical strategies to jump-start their creative thinking when “creative blocks” occur.

It is invaluable to teach students techniques and processes of ideation, for these tools and habits will help them succeed in life no matter their chosen field of work. The ability to generate original ideas is not limited to a select few *talented* or *lucky* people. It is learnable as a way to approach and re-approach a problem with an open and readily questioning mind. It is for this reason I chose to design this unit, *Chimera*, with problem-solving as a major focus. Students received incongruous elements by chance with the help of a die that they were challenged to reconcile into a cohesive mythological creature. Then, they used their new character as a departure point for creative writing. It was emphasized throughout that creativity is process that is sometimes long, sometimes using time and effort that will not be appreciated by – in the case of visual art – viewers. Too many people believe in the moment-of-genius epiphany and, while it may work that way for some, it is far healthier to see creativity as a series of possible approaches to a situation. I have heard from many people that after waiting for the moment of inspiration to strike them they became discouraged and surrendered. The creator can *act* to initiate the process. A good truth to cite is that the first artistic idea a person has is rarely the best, most original, or most personally consequential to the artist. Some possibilities are dead ends, some are abandoned, and some only partially fulfill the goal(s) of the piece. Some

rough drafts are never read by anyone else other than the writer. Scientific experiments can fail. There are sketches that are discarded when their further usefulness cannot be seen. Some parts of a plan are never put into action. However, all of this time and effort is never *wasted*. Everything that a person does informs his future actions. It is simply important to recognize that not all of what one does will be recognized by others.

Students need to know that to end up with a project they can be truly proud of, they will most likely need to do much more work than is required – much of it before they touch a brush, get clay on their hands, get out their camera, or open up Photoshop. This is the reality of the creative process.

Ideation underlies 21<sup>th</sup> Century Skills, but so are cooperation and collaboration. In Chimera, students were asked to work in pairs or groups of three to work through disagreements, respect individual differences, compromise, and, best of all, allow ideas for *everyone* in the group to fuel the creative effort. The people of the United States seem to be characterized by many as highly competitive and individualistic – characteristics that can be very productive. But, to grow as a nation and with the global economy, the other modes of human interaction need to be added. After this project was complete, most students better appreciated the potential good that can come from working with others to solve a common problem. These mythological portraits were larger than these fifth graders were accustomed to working. Although the challenge appears intimidating at first to any one person, individuals working together can achieve great things. I hear in this some echoes of democracy and civic responsibility.

## Procedure

Rolling a die, each group of two to three students generated a list of twenty-two numbers. Each of the twenty-two times the die was rolled the resulting number was recorded on a prepared chart. Each number corresponded with a certain predetermined characteristic, purpose, ability (or power), or habitat of a “mythical creature” (see Appendix A for worksheets). Students were challenged to cooperate to find a way to reconcile or merge the many characteristics, etc. from the ideation list into a life-size painting of their very own, highly original mythical creature. After the die-rolling stage of the lesson, the students were allowed to edit (modify), revise, and/or add to their list of characteristics according to their preferences. Each group planned extensively as they proceeded through this multi-step creative process:

- They refined ideas with small sketches (thumbnail sketches).
- While researching for useful images in library books, they sketched at a larger scale using twelve-inch long posable human stencils.
- Together they formulated a “tracing action plan” (a plan for the tracing in pencil of a group member’s body onto a large sheet of colored butcher/craft paper).
- They applied paint with large brushes (one to four inches wide) to model their creatures with value, color, and texture.
- They strategically selected and placed a multitude of embellishments (i.e., feathers, duct tape, glitter) to finalize their creations.
- To conclude the unit, they completed a short four-item post-assessment questionnaire, and also composed a detailed, imaginative narrative/description of their mythical creature.

(for the complete step-by-step procedure, see Appendix B)

## Data Collection and Results

Students were given a post-assessment questionnaire (survey). The four questions used in the questionnaire are below:

- Describe the characteristics of your Chimera mythical creature.
- What did you learn?
- Did you like rolling the die to help you get ideas? Why?
- How do you feel about making art with other artists now?

A major part of this research concerned how students *felt* about engaging in the die-rolling ideation or collaborative artmaking. I used comments to evaluate my teaching practice. I can make two generalized conclusions regarding the students' attitudes at the end of the unit using percentages. The numbers for the percentages are based on my interpretation of the responses to the last three of the four post-assessment questions. Note that only 74 of the total 84 students returned their questionnaires. Of the 74 students who completed the questionnaire, 39% enjoyed the die rolling ideation, 47% did not, and 14% were neutral. In reference to the collaborative aspect of the lesson, 64% of the students saw it as being beneficial/refreshing, 16% were against it, and 20% were neutral.

The relatively large sampling size (74 students) supports the likelihood of *reliability* of my conclusions. To fully determine the reliability of my research will require that my lessons for the *Chimera* unit be retaught by me or other teachers at a later date. The obtaining of similar results with the same age group of students during those future studies will then begin to suggest reliability.



## Discussion

Students began by rolling a die. The ideation exercise game generated for them a list of ingredients to work with. They were able to skip that blank-canvas-anxiety. Many times it just takes a little playful randomization to jump-start creativity. From the ingredients, students honed in on *their own* concept, and bent or changed the other elements to support that main concept. Every group received the same answer key of options, but no two mythological creatures ended up the same. Using this method, it is possible that no two creature concepts will ever be the same. This encourages me to research more ideation game formats and questioning prompts. As the body of my thesis suggests, I am curious to know if placing “limits” on a project strengthens creativity and problem-solving. Do limits function best at the beginning, middle, or throughout the entire art making? *Chimera* started in a controlled way for initial ideation and preliminary planning, but, soon after, opened up to full student choice. This format was successful for the age group (fifth graders), with more restriction (throughout with emphasis on the beginning to middle of the process) potentially benefitting older students. An option for possible improvement, especially for older age groups, would be to set specific limits on the amount of editing the students can do to their characteristics lists.

The students learned that through a process or processes, what starts out as a seemingly random “mess” can become strong art. The process may have been lengthy and unconventional, but the students’ minds were opened to new possibilities. Oftentimes art, and the ideas behind art, change throughout the artist’s process: time, inspiration, and patience are required. Students also encountered junctures called “mistakes” where they could have resigned, but, instead, chose to adapt and make the errors part of their work.

The students experienced the joys of synergistic activity, but also became aware of the fact that some differences of opinion among collaborators cannot be easily overcome.

The students can take the knowledge they gained from the lengthy planning process in this unit, and carry it forward with them as they tackle other daunting tasks. Piece by piece, humans *can* accomplish extraordinary feats. There are, of course, times when planning fails, or times when reaction and intuition take supremacy. One develops a plan to guide him/her in a general direction. The plan must allow for changes in course, large and small, to better meet the challenges of the current situation. However, the plan still sets the ultimate compass point, *the* destination, or the first of many destinations. One can see the value of this type of planning and strategizing for students in practically all aspects of their lives.



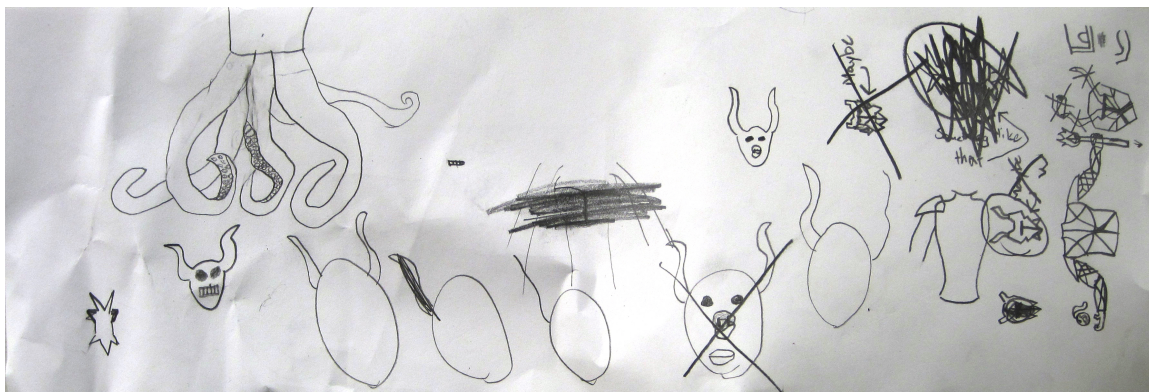
*Figure 1.* Chimera Unit Student Work. The die rolling activity (randomization) pushed students to merge a number of existing characteristics into a completely new mythical creation.

The products the fifth grade students created are highly original (see Figure 1), but they are more importantly a record of intense thinking, envisioning, group discussion, perseverance, problem-solving, and personal investment. Any unit / lesson can always be made better, or more engaging, and I look forward to introducing *Chimera* to other age groups, at different dimensions, and with other materials. *Chimera* provides an interesting mix of the rational and irrational; focused planning and reason serve the making of something enigmatic.

From my perspective, I know that what these fifth graders accomplished was more than they might have without the ideation die-rolling component of the activity. Despite the high percentage (47%) of students who reported frustration with, or plain dislike of, the constraints produced from the rolling of the die, it clearly helped expand the students' thinking. Like bad-tasting medicine, some things are cures in disguise. Much of the students' resistance – I surmise – came from their understanding of artmaking as a principally “free” activity that their prior school art experiences may have helped cultivate. With more experience from “constrained” assignments, students would likely shed their resistance. In Chapter III, we will cover how students learn to see infinite possibility within and through parameters. As someone I respect suggested, perhaps I could have cut down on the number of items on the characteristic list. Even though twenty-two items were “generated,” most students chose to focus on four to eight (as far as can be discerned from their finished paintings). Perhaps a democratic consensus could be reached so that the students could *own* the parameters and better understand their purpose. It is a tricky balance: how can a teacher force students to consider different possibilities, but still allow them more than enough room to pull from their “personal

aesthetic preferences”? I wanted to present students with a wealth of raw, unorganized possibilities. Students chose the elements and chance combinations that appealed to them.

It is difficult to quantify those mental processes that cannot always be readily seen in the artwork of a student. Take, for example, the criterion of problem-solving. I am certain that much of the problem-solving that took place happened in small conversations among the groups or between the pairs of students. In this private space of collaboration, agreements were made verbally and nonverbally. What I was able to sense of the students’ engagement with problem-solving mainly came from my firsthand observations of those sometimes loud, sometimes subtle – but always valuable – student-to-student interactions in each pair/group. The student’s positive response to required collaboration (64%) is highly encouraging. Despite some occasional challenges, many students appreciated the opportunity to mix their ideas with those of heir partner(s). It was also valuable because of the sustained constructive critical feedback the partnership/grouping provided. Due to the marked positive response and the factors just mentioned, perhaps a student’s *first encounters* with constrained art assignments should involve required collaboration as the only – or primary – parameter. More of my reflections on the unit and the teaching procedure I used can be found in Appendix C.



*Figure 2.* Example of Chimera Unit Thumbnail Exploration Sketching. Students learned that artists discard many of their ideas. Creativity is a process, demanding more mental work than viewers eventually see in the finished product. The Chimera unit encouraged students' healthy ideational fluency and conceptual play.

This unit was designed as a series of phases of problem-solving that amalgamated into the final large problem to be solved. There were radically different elements and attributes to reconcile, visual puzzles to solve, logistical plans to be made, and a cogent narrative to deliver. Much of the planning was done in the form of tangible sketches and notes on paper (see Figure 2). The students' degree of personal investment or ownership was fairly clear based on the complexity, level of finish, and inclusion of idiosyncratic or personal meaning and symbolism. The groups' edited, revised, and expanded characteristic lists for their creatures provide a physical record of the swiftly changing ideas.

I was more than satisfied with the level of maturity with which these fifth grade students handled themselves during this challenging unit. Students' level of persistence was strong, and their focus rarely distracted. It is evident, however, that they either needed stricter checkpoint deadlines on my part, or perhaps a few more weeks of time to work, or both. As I assessed, I tried to stay true to the rubric I constructed (see Appendix D). The scores for ownership and elaboration were high overall. Having the students trust

their own ideas and idiosyncratic meaning as material for art was one of the main goals of this unit. With the exception of perhaps four pieces (one of which was a two-headed dragon), I am so pleased to write that *all* of the paintings had that never-before-seen quality. Regarding the two-headed dragon, the students *did* make it very original with their idea to make one of the heads breath fire, and the other water and ice. The fifth graders created mythological creatures that are truly their own!

Also, the planning processes and tracing actual human bodies helped the students achieve believable proportions for their creatures. The drawn and painted figures engage the large-scale paper in dynamic ways. For fifth graders, working at this level, and at this scale, was so impressive. I am sure that many of these students feel they created something that is somehow beyond their capabilities. I am so proud of them.

### **Moving Forward**

Teaching the Chimera Unit was only a first step in the right direction. The purpose of the following research was to better plan for the next steps. While it is tempting to immediately start focusing on what *students* should do to enhance their own creativity, it is more useful for the art educator to first focus on the practical actions he/she can perform to build students' creative habits. Promoting students' abilities to find their own problems, for instance, creates certain pedagogical challenges for the teacher. Let us begin with the goal: creativity.

## CHAPTER III

### RECONSIDERING CREATIVITY

#### **The Invisible Word: Creativity**

It seems natural – or perhaps unnatural – to begin this discussion with the reconsideration of the commonly used term. After all, would it not be more efficient to accept the definition as it exists and move forward building on that established knowledge? MerriamWebster.com (2013) offered the following: “the ability to create” or “the quality of being creative.” While these phrases are widely applicable, they do little to shed light on what creative people do to create. It is most certainly a process. It must be initiated. It usually has a purpose. It can involve both analytic planning and intuitive flow. Sometimes a product or artifact is materialized. Sometimes the idea itself is the goal. The non-specific quality of the MerriamWebster.com definitions is most likely due to the fact creativity is a *human* activity – *everyone* engages in creative activity in some form or another. A dictionary definition could not possibly encapsulate the varieties of use for the concept of creativity, or render fully its protean dimensionality. The meaning of the word is constantly changing, evolving with technological advancement, assuming a slightly different character depending on the discipline handling it (for specific means and ends). There is an aura of elusiveness that surrounds the task of putting *creativity* into words, the task of defining it. The word/concept often, upon extremely focused inspection, appears to dissolve into invisibility. Applying words to *creativity* must also be done carefully, for, as William Wordsworth famously wrote in one of his poems, “we

murder to dissect” (as cited in Perkins, 1987, p. 37). A *biopsy* is perhaps a more accurate metaphor for our search: the prudent sampling of tissue for diagnostic purposes. The analysis of every single cell in the human body is impossible, but a carefully selected few cells can reveal the status of the entire body. The same is true of “the body” of creativity.

Zimmerman (2009) concluded that creativity’s lack of a “common definition” strains educational usage of the word (p. 386). Despite the difficulty in explaining what creativity is or does, one needs to refine an understanding of the word as is useful for him or her. An idiosyncratic definition – in this case – may be the most valuable. And idiosyncratic definitions *are* useful to others; *a posteriori* knowledge accumulates into larger conclusions. In this first section I explain what *creativity* means to me. More than anything else, it is an attitude, a way of approaching any situation with flexibility of mind. As we will address later on, one fundamental tenet of this description of creativity is a belief that *all* assumptions must be reconsidered, nothing is taken as given, and one should question everything. It begins with this courageous mental flexibility that creativity is formed. Especially important to educators: How does one support that attitude of adaptability and flexibility? Are there strategies or approaches that can be taught? Before we dive into those questions, let us return to delineating some more meaningful descriptions of creative behavior.

“The word creativity [emphasis removed] [is usually used as] . . . a generic term for children’s overall artistic output” (Jaquith, 2011, p. 14). In other words, many people do not consider creativity a mental capacity; instead they connect the concept directly with products or bodies of products. Should one’s creative capacity really only be judged by his/her product output? I think not. First, quantity of product does not necessarily



equate with originality of thought. Second, if detecting creativity is based on products, then one could potentially mimic the creative artifacts of others and be considered creative. Third, is making something – anything (even making through copying) – as valuable as creating something of great personal meaning, after much anxiety and self-discovery, and which came as an authentic “answer” to the questions one conceived and refined for him- or herself. It is more useful to think of creativity as a process, a series of mental actions, instead of purely output. If the thought processes behind an artwork are of high quality, then the work itself is usually of similar quality. A quality art curriculum should focus on the phases of creative thinking leading up to the product as much as – if not more than – the final product.

### **Talent and Intelligence**

Some might define *talent* as an advantageous predisposition. According to that perspective, the efficacy of a teacher to teach may seem limited. For instance, if creativity is seen as a “talent,” something a person is born with, then can it really be taught? Eisner (2002) asserted that “ability in art is [wrongfully] assigned to talent, ability in ‘intellectual’ subjects like math and science to intelligence” (p. 43). Associating creativity and talent the way many people seem to do, is harmful for purposes of education. It is debilitating for teachers, and demoralizing for students. If creativity is a talent and cannot be taught, then what motivation does a teacher have to attempt to teach it? And what motivation does a student have to believe in his/her learning? Viewing creativity as a “*stable, uncontrollable* trait” would be an “entity view of ability” rather than an “incremental view of ability” (Woolfolk, 2008, p. 426). In the incremental view of ability, an educator discovers his/her power to effect positive changes in the lives of

his/her students. Ideally, teachers should believe that they can teach *all* of their students, advancing each pupil beyond his/her current state of knowledge and/or ability. That would include students with and without perceived talents. Predispositions, talents, hereditary traits cannot be taught; but they can be enhanced, guided, and polished by a teacher. Zimmerman (2009) confirmed this belief:

In the past, creativity sometimes has been considered as pertaining only to a few individuals within a specific cultural context. A model of creativity for the visual arts that is inclusive rather than exclusive, and views creativity as possessed by all people, not just an elite, is one that should be encouraged. (p. 393)

Creativity is regarded with “sacredness”; understood as being “bestowed on a lucky few,” with “*creatives*” separated from “the rest of us” (Simons & Skoreyko, 2011, p. 11).

Simons and Skoreyko went on to say that those individuals designated or self-designated as non-creative “resign[ing]” their efforts (2011, p. 11). Clearly, doubt in one’s creative capacity appears to be learned. Educators can work to either erase this doubt or intensify it.

“Creativity is a cognitive capacity, like intelligence, and should be treated as such. . . . Creativity [is] something we do, [a] capacity [that] can be nurtured, cultivated and developed” (Simons & Skoreyko, 2011, p. 11). Here we arrive at *intelligence* and its entanglement with creativity. Creativity is *like* intelligence, but not the same. Or perhaps creativity is a type of intelligence that hasn’t yet been fully recognized with its own widely accepted testing instruments. IQ testing (its validity always debated) has become one of the most popular methods for measuring intelligence. In a study involving 200 students attending the Art Institute of Chicago and a “cross-section of the college population” from the Chicago area, Getzels and Csikszentmihalyi (1966) investigated the possible correlation between intelligence and creativity:

Our art students, when given various IQ type tests, turned out to be no more or less bright than college students. . . . It seems, then, that superior IQ may not be essential in art the way that it is in certain other creative disciplines. We can imagine a man or woman being a highly successful artist without possessing spectacular intellectual powers *as indicated by a very high IQ* [emphasis added]; but it is difficult to imagine a Nobel-prize-winning physicist not having such intellectual powers. It appears that creativity and intelligence may represent different processes and that intelligence is required in widely different degrees in different fields of creative endeavor. (p. 33)

Again, not everyone supports IQ testing as an accurate determinant of intelligence. What Getzels and Csikszentmihalyi have written seems to suggest that while IQ “intelligence” may not be required for success in artmaking, creativity is needed to some degree in all cases – from physics to drawing. Zimmerman (2009) described a similar conclusion: “Some researchers assert that to be creative, a person needs intelligence, but not all intelligent people have high creative potential (Davis & Rimm, 1998; Renzulli & Reiss, 1985)” (p. 386). Creativity is distinguished as separate or partially separate from IQ intelligence, but equally as important for full mastery in one’s pursuits.

Many people seem to trust quantitative data over qualitative as evidence in research. It remains to be decided if creativity is reducible to numbers, to percentages of correlation. Measurement instruments for creativity, as they are currently designed, mainly use exercises of divergent thinking (Runco & Okuda, 1988, pp. 214-215; Zimmerman, 2009, pp. 387-388). Divergent thinking tests target fluency of ideas; sometimes participants are asked to make lists of “distinct” ideas, actions, items, etc. in response to a prompt. It is debatable as to whether such divergent thinking tests adequately measure creative capacity. While each of the participating subject’s listed responses should be distinct (different from other items on the list), their usefulness or relevancy to the prompt is not always measured (Runco & Okuda, 1988, pp. 214-215,

219). Divergent thinking, which, as mentioned, usually refers to a person's ability to generate a large volume of ideas, is one of those aspects of one's *interior landscape* (a phrase borrowed from Eisner, 2002) that can be readily sensed by others. A teacher, for example, might sense that a student is "bright" because he/she seems to be a virtual fountain of ideas. "Divergent thinking," Mark Runco notes "is predictive of teachers' judgments of students' creativity" (as cited in Runco & Okuda, 1988, p. 213). Within acceptable limits, the classroom appreciates divergent thinking.

If, however, the divergent thinking of a student moves beyond acceptability into subversiveness, then creativity becomes a threat to the controls and structure of the school. According to Robert Sternberg (as cited in Zimmerman, 2009), intelligence "advanc[es] societal norms," whereas creativity "oppose[es] societal norms and propos[es] new norms" (p. 386). Citing the 1983 work of Getzels and Smilansky, Runco and Nemiro (1994) explained further:

Creative individuals seem to thrive on diversity, complexity, and novelty, and these traits can each be difficult to find in the typical classroom. Creative and divergent thinkers may thus be difficult to reach in the classroom. Moreover, teachers may for this reason prefer students with exceptional intelligence rather than those who think divergently. (Problem Finding section, para. 6)

Gregory Feist (as cited in Zimmerman, 2009) proposed that "most creative people do not conform to conventional ways of knowing" (p. 386). The nonconformist nature of the student who asks his or her own questions and "defines problems for him- or herself can be difficult in the classroom. . . . Some behaviors which are viewed as problematic may actually reflect healthy creative development" (Runco & Nemiro, 1994, Educators as Models section, para. 2). Runco and Nemiro (1994) go on to say that "many educators may need to reexamine the way they view the divergent behaviors of students"

(Educators as Models section, para. 2). Is not education expected to *open* possibilities? Is not a student supposed to question in order to better understand?

Certain limits on student behavior and ideas may be practical and necessary, but perhaps some opportunities to support creative thinking are being sacrificed for institutional expediency. Each teacher decides what the expectations of his/her room are. And, even more influential – it seems -- on students' learning outcomes, is the character or personality of those expectations. They should contribute to a classroom atmosphere that encourages inquiry and play with ideas. The classroom (the art room in my case) should be a safe place for exploration and diversity of thought. Of course, it always depends on the teacher and his/her teaching style, but the art room appears to naturally provide a place for the healthy exercise of divergent or non-conformist activity. The non-conformist activity must be respectful of others, non-threatening, and within school policies. Non-conformism in the school climate is more about having the freedom to engage in more idiosyncratic, or individualized, thinking and doing.

### **Revealing the Inner Self**

Self-discovery is a very common theme in literature on the value and purpose of art – for both artists and the audience. Making art is just as much about slowly revealing the artist's inner self to him- or herself as it is about communicating ideas and feelings to others. In effect, the artist engages in sustained self-discovery for the benefit of others who may have other priorities; for those who see themselves as somehow “less able” or “too busy” to ask the difficult questions of life. Others' appreciation for their own humanity is deepened by their experience of art. And art can most naturally be thought of as the records artists create of their own experiences, thoughts, and feelings as they seek

to reconsider the complexities and meaning of living life as *conscious* human beings. “Creativity is auto-didactic; that is, it involves self-study . . . [and] is self-motivating” (Freedman, 2010, p. 12). Serious self-study is never easy, but is necessary for living a fuller life. Reversing the microscope to look within can be frightening, surprising, and/or unpredictable. The process can be characterized by anxiety. Gude (2010) posited that “anxiety is a necessary component of a truly creative experience” (p. 36). After all, what revelations wait for us in the interior world? Are we who we think we are? Is this the way we imagined living before the visions and goals of others became our own? Is something missing? Do we find our personal explanations for happenings in life satisfying?

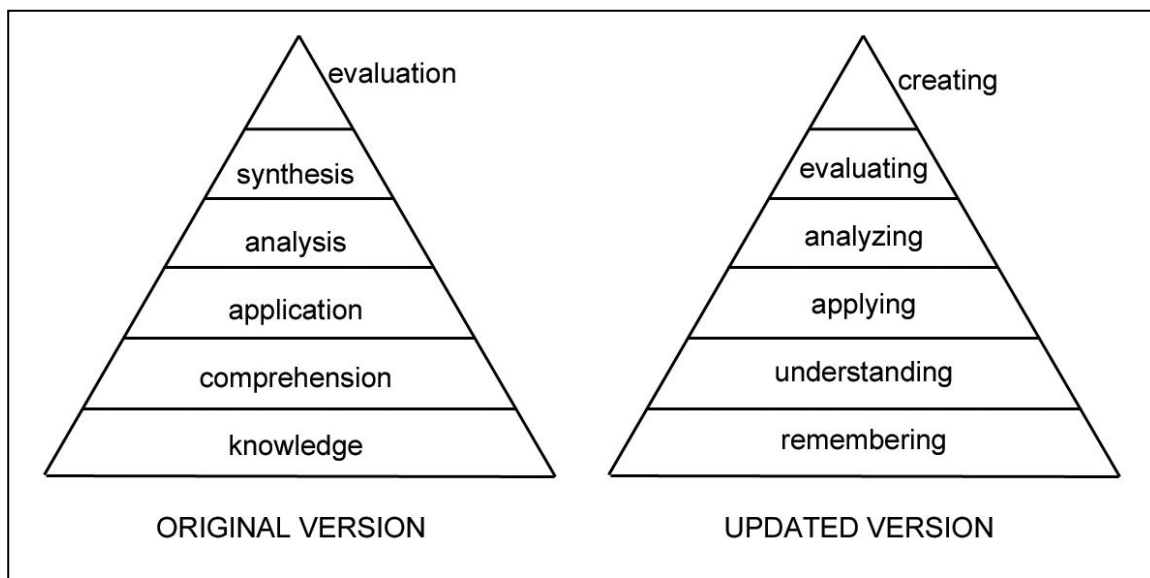
Anxiety can also come from one’s realization of one’s power to bring forth something unique into the world. “What could possibly capture one’s attention faster or more completely than personal realization of the power to discover – to create knowledge” (Parnes, 1977, p. 473). The artist literally transforms nothingness into something, or something as it currently exists into something else. The urge to create is situated within the individual, kindled by one’s idiosyncratic life experiences. Another source of anxiety is one’s development of, and trust in, one’s own potentially divergent ideas, “voice,” “style,” or “aesthetic.” Students derive the material and questions for their art from within themselves. The student artist, just like adult artists, should feel “like an ‘origin,’ not like a ‘pawn’” (Zurmuehlen, 1990, p. 18). “Educators,” Parnes (1977) wrote, “have too frequently been accustomed to pouring in from without, rather than drawing out from within, as the word ‘educate’ literally means” (p. 473). Artists are most readily inspired by what they know: where and how they were raised; their former and current relationships with other people; their cultural backgrounds; interests they have developed;

and favorite spaces and locations they encountered during travels. A teacher facilitates an art student's inward sourcing for content; he/she meets the students where they are and maximizes their developmental growth from there. "In education, ideas that are novel to a learner can be considered creative" (Nickerson, Rostan, & Zimmerman as cited in Jaquith, 2011, p. 14). In other words, a breakthrough for the student is incredibly valuable regardless of whether the idea has been used by someone else in a similar form. In the art room, a lesson can begin with all students taking the same first few steps and still conclude with every student taking a very different creative direction. No two paths of development will be identical.

It is my ultimate goal to teach students to embrace their own ideas – to search for the next great story or character or imagery within themselves. Looking back on my younger years, I remember consciously and unconsciously undervaluing, overlooking, or even going as far as to discredit my own life experiences as being unworthy of "art." As a teacher now, I often contemplate this common emotion. When, and how, did my authorial spirit weaken? For me, it was in high school – a time when I recall feeling unsure of many things and also a time when I pursued grand themes and imagery (much of it foreign to my direct experience). Instead of trusting my own life experiences to guide my artistic direction, I incorporated certain charged imagery – to, in effect, borrow its power. Now I know that borrowed power is never as striking as simple, authentic expression derived directly from real experiences. This lesson I hope to bring to all of my students.

### New Syntheses

Contemporary art is usually distinguished by its focus on process over the appearance of the art object/idea. An essential part of the artist's process is synthesis. Artists constantly synthesize concepts, materials, references, styles, disciplines, and even multiple processes. It should be mentioned that synthesis and creation are near or at the tip of both the original and the revised Bloom's Taxonomy pyramidal classification systems for assessing cognitive behavior (the level of students' processing of information) (see Figure 3). Creating art, which entails much synthesis, is a higher order thinking activity.



*Figure 3.* Bloom's Taxonomy (Original and Updated). "Synthesis" and "creativity" are placed high on Bloom's scales for the complexity of students' thinking.



Currently, we are said to be in a period of pluralism, which means no single dominant style or medium has yet emerged to define the aims and means of contemporary art. *Everything* is available as potential art: ready-made material, social media, advertising, community dynamics, performance art, industrial manufacturing, installation, and water color painting. Now many artistic traditions are being continued, updated, and dismantled simultaneously – all of them moving generally parallel to one another to an unknown future. It seems that being well rounded and knowing about many fields and processes would benefit the 21<sup>st</sup> century artist. Mainly because of this observation, *strict* purism in the various regions of art is ebbing, while interest in multi-media and interdisciplinary approaches is on the rise. Could this be due to the fact that contemporary art (as seen in many of today’s museums and galleries) is intrinsically multi-faceted with many perspectives? Rarely do painters today just paint, sculptors just sculpt, performance artists just perform movements of their bodies, and so on. It helps to step outside the limited and comforting space of one’s field and see it anew from an unexpected angle, e.g. to see a physical space through the lenses of geology, psychology and biology. The progression of mental ideas may seem like sidestepping laterally before being able to proceed forward to a “new” concept. *Lateral thinking* – sometimes “used interchangeably with creativity” (de Bono, 2013, Lateral Thinking section, para. 1) – is a term we will cover later in Chapter V.

Art historians often cite as a major art ideological transition the shift from modernism to post-modernism and what followed post-modernism. Some associate modernism with “illusions” of self-importance; many artists of the period saw themselves

as independent revealers of truth (Freedman, 2010, p. 9). Ilya Kabakov, a prominent Russian-American conceptual artist, insightfully clarified this ideological transformation:

Modernism has to do with an extraordinary confidence on the part of individual artists in their own genius, a confidence that they are revealing some profound truth and that they are doing it for the first time. The postmodern consciousness arises in a society that doesn't need new discoveries, a society that exchanges information, that correlates all possible languages and establishes interrelationships between them. You could say that modernism juxtaposes itself to all that has preceded it in the past, while postmodernism means primarily participation in one unified field or network of artistic life.

The most profound difference is the attitude towards artistic language. Modernists are absolutely certain of their authenticity; they believe they have created a genuine, universal language. For postmodernists, all languages are equally authentic or unauthentic at the same time. The modernist is convinced that he has developed his own universal language, whereas the postmodernist knows that all languages have already been worked out, and he is searching for the interrelationships between them. . . . Today's postmodernist artist works not only with ready made things but also with ready made artistic languages. (Storr, 1995, p. 67)

Originality in the sense of “revealing some profound truth [...] for the first time” is unrealistic in the postmodern era. According to Kabakov, nearly every idea in every field of human knowledge has already been explored to some degree; all of the various “languages” have been developed. Following this logic to its terminus, one might conclude that all novelty (the glorified idea that something can be introduced to the human mind that is completely unfamiliar to it) is an illusion. How can any artist accept consciously such a disenchanting and hopeless statement? Only partially, do I concede to Kabakov’s terms of a seemingly bleak postmodern future. Reflecting on the “original” ideas of the past most, in fact, did not arrive from thin air and isolated from other human thoughts. Creativity does not take place in “a historical vacuum”; “it always refers to some past occurrence being reconsidered in the present” (Freedman, 2010, p. 9). “Many great thinkers, following Socrates and Plato, have sustained the idea that any discovery is

actually a rediscovery” (Arieti, 1976, p. 406). “In science,” Arieti (1974) went on to say, “it is easy to accept that discoveries are in fact rediscoveries of something inherent in nature” (p. 406). Rediscoveries can be as *original* as discoveries. In Freedman’s words, French philosopher Foucault believed that “ideas are a product of subtle distinctions between ‘old’ and ‘new’”(2010, p. 10). Take, for example, Picasso’s blending of cubist and African folk art aesthetics. His creativity, and possibly all human creativity, originated in the ability to generate new *combinations* of old revelations, to create *connections* between thoughts that might not be connected otherwise. “Creative production in the visual arts brings together concepts and skills to convey new meanings, perhaps convincing people to think differently or take innovative actions” (Freedman, 2010, p. 14).

Parnes (1977) summarized creativity as “the fundamental notion of the ‘aha’ – meaning the fresh and relevant association of thoughts, facts, ideas, etc., into a new configuration, -- one which pleases, which has meaning beyond the sum of the parts” (p. 461-462). “Lewis Walkup . . . observed that creative outcome seemed to depend largely upon . . . the skills by which . . . individual[s can] sense the properties of the new combinations of things” (as cited in Parnes, 1977, p. 475). True creativity exists in the specific constellation of thoughts that synergize and inform one another. Writers do not usually burden themselves with creating new words to use in their language, unless they aspire to be like Shakespeare. They begin with a given spectrum of words (diction from the dictionary), and seek to craft stimulating syntax, descriptions and narrative style. In regard to music, just because great symphonies, etc. have been created in the past does

not mean that the elements constituting those musical achievements (notes, harmonies, or musical scales) cannot be used by future musicians.

In much the same way, contemporary art emphasizes appropriation, form and process. Each element synthesized into a work carries with it referents to previous works done by different people, and thinking accomplished by others. Novelty comes with the interconnection of forms and processes that are layered. The more layers an artist uses, the more likely his/her work is to be perceived as stimulating and fresh by viewers.

““Something is created that has never before existed in exactly that form””(James as cited in Zimmerman, 2009, p. 389). In fact, many complex layers are requisite in a piece of art to avoid having it understood as simply a rehashing of old ideas. Figuring out the sources of the individual ingredients should not be the main interest of the pastiche; how they function in the whole framework of the construction should be. The materials and processes involved need not be original in themselves, yet the cumulative concept should be; in addition, the synthesized idea should be cohesive.

A simple, yet insightful, definition of creativity has been offered: “Creativity happens when someone does something *new* that is also useful or generative or influential” (Csikszentmihalyi; Simonton as cited in Stokes, 2006, p. 1). “Something new” can certainly be a *new* combination or recombination. And imagination is definitely the driving force behind this combining. The Webster’s Ninth New Collegiate Dictionary defines *imagination* as the “act or power of forming a mental image of something not present to the senses or *never before wholly perceived in reality* [emphasis added]” (as cited in Kay, 1998, p. 267). Framing creativity as the merging of existing things is not

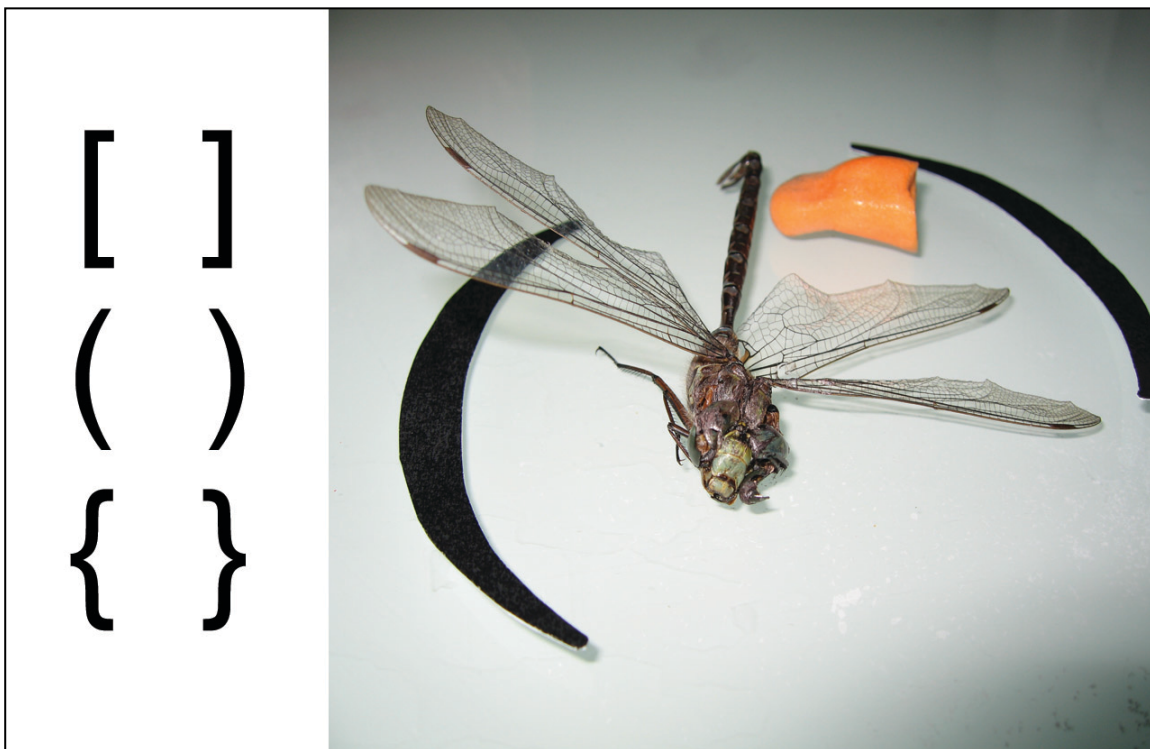
limiting; it is actually liberating. It frees one to experiment and play with concepts, materials, and techniques to innovate.

### **Bracketing**

As part of an exercise one of my college sculpture professors assigned to our class, we were given photocopies of two larger-than-normal bracket symbols (see Figure 4). Analyzing it now, it was likely a playful ideation exercise. We were instructed to place the brackets around combinations of objects in real, physical space, and then to photograph the paper brackets and the bracketed items. We will later discuss synectics, which I believe may have inspired the bracketing activity. Although, brackets have also been used in phenomenology as a way for one to set aside his/her “pre-judgments,” or prior understanding, in favor of gaining access to the perceptual primacy of a phenomenon (see Chapter V for more on phenomenology). Instead of being focused on the enhanced perception of one object or phenomenon, brackets for synectics capture *relationships between* objects, qualities, images, and events.

Returning to the sculpture exercise, the brackets enclosed the space, focused thinking, and revealed possible connections between objects and images that might not otherwise be brought to consciousness. They also formed a lens; while clarifying what was within the limits of the lens, it also obscured and removed what was not. Eventually, the brackets would surround an intriguing pair of unrelated items. I find it helpful to fight the urge to identify differences, and, instead to explore every possible area of similarity. Most perceived differences are superficial – impeding the flow of ideas. Bracketing can stimulate the mind’s movement toward an idea or purpose for the creative activity. The beginning of this process is nearsighted. It guides the generation of ideas from one idea to

the next idea that the former idea triggered. Like most brainstorming, it could be explained as deciding to head in one direction while traveling with no specific destination in mind. The final destination is not important because it must always remain open to change, both to small and considerable changes of course. Maintaining this plasticity of thinking is vital to keep the idea-generation process fluid.



*Figure 4.* Synectics/Phenomenological Bracketing Exercise. Large printed brackets can enhance students' consideration of interesting connections between ideas and objects, i.e., a dragonfly and an earplug. When used with a single idea, object, or experience, the brackets assist one in focusing on the phenomenal, or strictly sensory, qualities of what is bracketed.

It was mentioned that bracketing focuses thinking, and forces a change of *perspective*. More than one changing what one is doing, “creativity depends on changing the way [one is] doing something” (Stokes, 2006, p. 126). Changing from drawing cars to

drawing exotic plant life may seem like a significant shift that may spark creativity. But, what would drawing plant life through the aesthetics of machines generate? In that complex *translation*, what breakthroughs might happen as a result? “Most problems are not new. The challenge is to view the problem a new way. This new viewpoint in turn embodies the potential for a new basic solution” (Prince, 1967, p. 5). Prince (1967) also emphasized the importance of approaching the “familiar facts of the problem” from “strange angles[.] . . . A usefully strange Example [*sic*] can suggest not one but many different potential solutions or viewpoints” (p. 9). Looking at situation from a new vantage point can sometimes expose what was previously invisible to examination; it can uncover the big picture. “In science, creativity often consists of the ability to extract a formerly obscure or apparently inessential aspect from all the relevant data” (Arieti, 1976, p. 406). What Arieti said of science can very easily be applied to visual art. The idea for a future art exercise came to me as I read the writing of Prince, Arieti, and others. I will ask my students to attend a social or amusement attraction (i.e., a zoo, a music, concert, an athletic event, any place and time where there are many spectators). While they are at this event of their choosing, they will be asked to consciously force themselves to look in the direction opposite of where all of the other spectators are looking. What will they notice? What will they learn about looking, perspective, and experience?

It has been suggested that highly creative individuals are not only able to change their perspective, but are also adept at holding *multiple* perspectives in their minds at the same time. Making and appreciating art is never done from a single perspective. An artist must consider their work formally, conceptually, historically, personally. An artist also

considers the marketability of his/her work, and how critics might receive it. From her studies (1989, 1991), Kay (1998) concluded that when comparing the idea-finding and problem-solving behaviors of two groups (professional artists/semiprofessional artists, and nonartists), the artist group tended to consider more factors, variables, elements and “alternatives” simultaneously. The nonartists “usually reported a focus on only one option, such as color, and ignored other dimensions[;] . . . they employed fewer dimensions and viewed fewer perspectives” (p. 274). Again we come across evidence that artmaking in most cases involves complex, multi-layered, and multi-directional thinking.

### **Introducing a Creativity Curriculum**

“We must,” Gude (2010) professed, “question the assumption that *any* [emphasis added] art project will cultivate creative behaviors” (p. 31). It is, of course, the art teacher’s responsibility to *design* lessons and creative experiences that encourage creative behaviors. Not every art teacher will respond favorably to Gude’s statement. At the center of these feelings may be a realization that the responsibilities of the art teacher to student’s cognitive development have increased. It may sound a bit strange but the increase in freedom and student choice in art lessons actually increases the amount of work and planning that an art teacher must do. And, as will be explained, it is not simply more work that an art teacher must do; it is more *strategic* work. One might ask, ‘What exactly is meant by creative behavior?’ Gude (2010) offered this list: “stimulating free ideation, encouraging experimental approaches to making, and supporting students in identifying and manifesting deeply felt idiosyncratic experiences” (p. 31).



It is certainly vital that educators regularly exercise creativity strategies (i.e., ideation, experimentation, self-regulation, perseverance) in the art room so that students might develop, what I view as, the most essential cognitive habits for the now evolving decades and century. Carl Rogers advocated these three goals for art education curricula: “(1) the ability to play [conceptually as well as visually]; (2) openness to experience [trust in, and surrender to, the stimulating results of the creative process]; and (3) an inner locus of evaluation [self-assurance in the validity and value of one’s ideas, however divergent those ideas are from social acceptability]” (as cited in Gude, 2010, p. 36). Related to openness of experience, Gude (2010) also included the suspension of judgment (p. 37). Gude (2010) expanded on the mission of play for arts education:

Although it may seem counterintuitive, a creativity curriculum must be structured to teach methods and practices of playing with elements and concepts. . . . The primary objective of a creativity curriculum ought to be developing the capacity of students to instinctively respond to situations with playful creative behaviors. (p. 36)

To summarize the thoughts of Rogers and Gude, a creativity curriculum is structured to develop students’ positive attitudes toward experimentation and risk-taking; to give them tools for, and training in, self-regulation during their independent artistic inquiry; and to deepen students’ trust in their own idiosyncratic ideas while celebrating the divergent ideas of others. Gude (2009) also proffered a connection between art education and a certain spirit of democracy and respect for individual differences:

Through quality art education, people learn that they do not know many things that they once thought were certain. They learn to play, not just with materials, but with ideas. Study of the arts, especially contemporary art forms, cultivates in people the capacity to tolerate *cognitive dissonance* [emphasis added]. They develop the strength to continue to engage in perception and reflection even when they do not find easy answers or even, readily discernible patterns. (p. 10)

It is probable that creativity may be primarily attitudinal; it may reference the manner in which one approaches a task. The best definition of creativity that I came across in my research would have to be the one from David Edwards (as cited in Simons & Skoreyko): “The ability to experiment toward productive acts” (p. 10). But, what is the art teacher’s role in the experimentation of his/her students? The art educator’s degree of influence on the artistic expression of his/her students has evolved with the history of public art education. In the United States, the child-centered approach became widely accepted in the late 1930s. Continuing for over 50 years, the main animating spirit behind child-centered art education was the promotion of children’s naturally occurring, *pure* self-expression. There was to be little or no adult interference in the artmaking activities of students: “Creativity was regarded as being innate and developing naturally without imposition of adult interventions. A teacher’s role in a visual arts program was to provide motivation, support, resources and supplies” (Zimmerman, 2009, p. 384). Later, in the 1950s, subject and content centered approaches moved into popularity, followed by Discipline-Based Art Education (DBAE) in the 1980s and 1990s. In these frameworks, the influence of the art teacher on the content of lessons and the guiding of students self-expression became more overt.

Today, teacher direction and control again appear to be abating slightly in favor of drawing out students’ idiosyncratic creativity. It is not likely that we will return to child-centered art education exactly as it was employed in the past; education is certainly a reflection of the times. DBAE created expectations for art education curriculums that will continue on long after the next major model of art education has been identified. The idea of art as a subject in school as important as the other “core” subjects was cemented in

place with the help of DBAE. Although this carried with it clear benefits, will a teaching curriculum for art without standards-based assessment, and definite cultural, critical, aesthetic, and art historical components be taken seriously by the current education establishment? Choice-based art programs present special challenges. Teachers of choice-based programs are working with the DBAE model – and sometimes against it – to explore new possibilities for teaching artistic behavior and creative thinking.

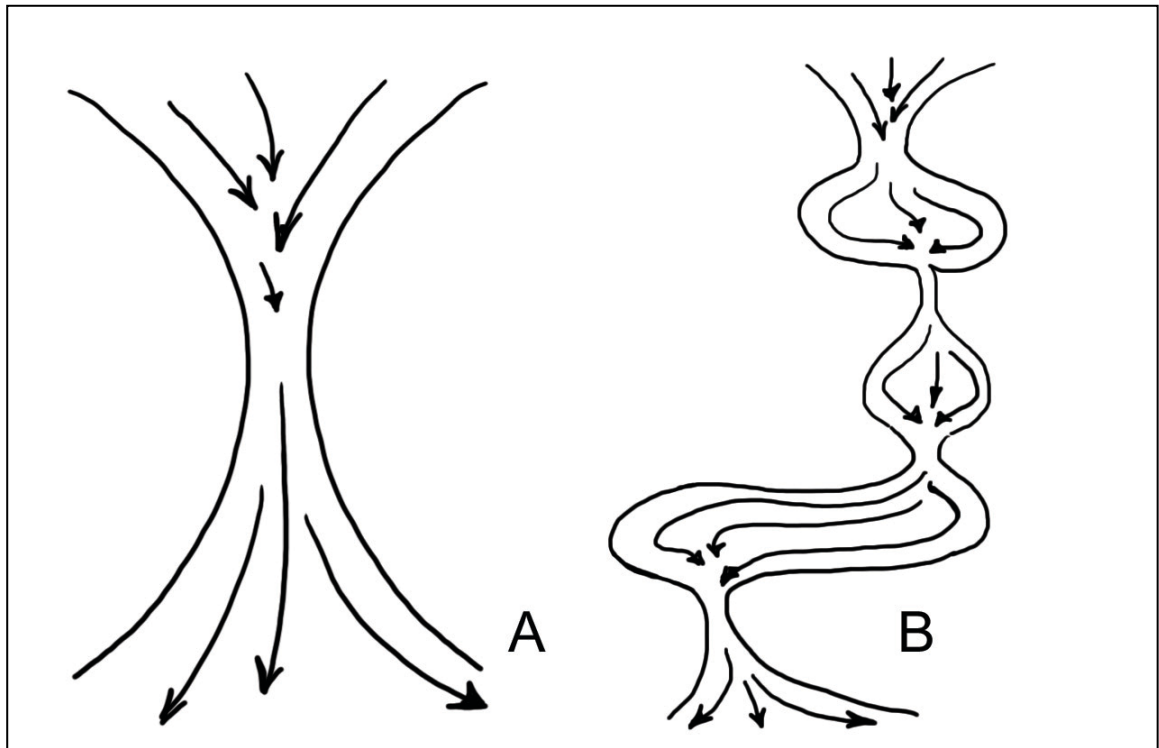
Nevertheless, the effectiveness of such programs is usually still judged against national and state standards. The situation is precarious: on one side we have the growing of renewed support for a child-centered curriculum and on the other we have the established expectations of the appearance and function of art education in schools from DBAE.

What can be concluded is that the role of the art teacher as a *guide* has become fairly set. The art educator can no longer be a facilitator, a provider of “resources and supplies”; he/she is directly responsible (in the minds of other adults) for the learning of his/her students. A measure of teacher “influence” is expected in most cases – possibly even in choice-based programs. With two goals for teaching in mind – creating more opportunities for student choice, and acting effectively as a guide – how does one proceed? It begins with an analysis of *parameters*, and then the art teacher’s use of them in assignments as strategic influences.

### **Parameters**

Similar to brackets, as we described them earlier, parameters serve to focus thinking. Dictionary.com (2002-2013) provided the following definitions for *parameter*: “[a] limit . . . or boundary . . . ; guideline . . . ”; “characteristic or factor; aspect; element”; “any constant or limiting factor”; “one of a set of measurable factors . . . that define a

system and determine its behavior and are varied in an experiment”; “a factor that determines a range of variations”; “A factor that restricts what is possible or what results.” We continue with a central question: Are parameters (or constraints) really limitations? They first constrict freedom in order to expand it. The most relevant definition from the collection above: “a factor that determines a range of variations.” The uniqueness of every human being is a constant. As was mentioned earlier, the possibilities for what can be considered art are limited by very little.



*Figure 5.* The Bottleneck as a Model for Constructive Constraints. A single productive constraint can be imagined as a single bottleneck (a), while a combination of constraints – or a series of them – can be thought of as a series of bottlenecks (b). The process of refining ideas can shift laterally (b).

Parameters can be thought of as a collective bottleneck – or a series of bottlenecks – that concentrate and compress possibility before opening back up to complete freedom on the other side. The compression can help a person focus their unique creative potential. Ideas are *changed*, but not restricted, by the phase of compression. See Figure 5 for further clarification of the bottleneck. A constraint, in the context of this discussion, does not confine; it merely creates a space for further *variation*, or divergent problem solving.

Before a creative act is begun, there oftentimes exists a feeling of paralysis in the face of infinite possibility. Bartel (2012) commented on the phenomenon as he had encountered it: “If I ask students to do whatever they want to do, they often avoid risk by doing something they already have learned in the past. The amount of creative thinking may be zero” (#7 section, para. 1). Ironically, the weight of freedom can be crushing: “We can say that students must do work that is original; and, yet we establish boundaries of that originality, because without such boundaries, students often become disheartened and find it difficult to work at all” (Freedman, 2010, p. 10). Stokes (2006) reflected on what occurred in one of her college drawing courses: “What fascinated me was that the drawings done to Albert’s [her instructor] specifications were always more interesting, more creative, more compelling, than those we composed when left to our own devices” (p. xii). Too much freedom (it is strange to write those words in connection with art making) can make starting a project difficult, fear-ridden, or anxiety-wrought. One might call it blank page anxiety (Sapp, 1997, p. 282).

Someone once said, “To create, one must first destroy.” The words apply perfectly to the emergence and refinement of an idea. When, from the formlessness of

possibility, a definite idea is born, other possibilities are simultaneously eliminated. And, so the process continues as the idea becomes progressively more specific and the other versions of what could have been fade away. Staring at a blank canvas, one knows that the first mark will influence all the marks, shapes, colors, and concept that will follow. An arbitrary stray line or smudge of charcoal can release the artist's mind to explore the possibilities of that line or smudge instead of exploring the possibilities of *their* first decision; it can destroy that paralyzing absence. "Framing [a] . . . task . . . free[s] . . . creative force. . . . It is often easier to direct your energy when you start with constrained challenges (a sculpture that must also be a clock) or constrained possibilities (a canvas that is marked) (Mayer, 2006, para. 3). Sapp (1997) boldly stated the value of limits:

"Limits yield intensity. Parameters on a task focus creative intent. A set of rules, however permanent or temporary, created by the artist or the art teacher, may amplify the creative endeavor. . . . Students need and want parameters to define their studio problems." (p. 283)

"Enabling constraints" (Davis, Sumara, & Luce-Kapler as cited in Graham, 2009, p. 201) can be used as creative "tools" (Stokes, 2006, p. 131). The idea of the art teacher's *strategic* influence was introduced earlier. These creative tools form the pivot points of the strategy.

### **Types of Constraints**

Mayer (2006) argued that creativity is not what most people think it is. In her words, it is *not* "unbridled, unguided effort that leads to beautiful effect" (para. 1). Rollo May (as cited in Sapp, 1997) has written similar words: "Creativity is not a completely unlimited, boundless, expansive experience. Any creative act is shaped and determined by specific environmental, physical and conceptual limitations" (p. 283). Every art assignment has certain inherent restrictions built into it – some are explicit (e.g., "a self-

portrait painting.”) and others are implied by the manner in which the teacher presents a project to students. More common in the fields of graphic design, industrial design, and illustration is the task of solving more intentionally constrained problems. A graphic designer might be asked to create a logo with only three colors, with a total size of 4” X 4”, and using nautical imagery as inspiration. There is a definite problem to solve. Parameters may have to do with a number of elements: time limit, media, subject matter, visual language, and expressive content (Sapp, 1997, p. 287-288).

In her book, *Creativity from Constraints: The Psychology of Breakthrough*, Stokes (2006) defined four major types of constraints: domain, cognitive, variability, and talent (we will not discuss this last one). The first type, domain constraints, consists of three subtypes: goal, subject, and task constraints. Domain constraints either work with or against the established traditions, conventions, definitions, and categorizations of a domain or field (p. 131). They “preclude . . . [the] domain’s dominant (most rewarded, most recognized) solution . . . to promote a new one” (Stokes, 2006, p. 12-13). Successful constraints are designed in pairs “to preclude (or limit search among) familiar, reliable responses and promote (or direct search among) novel, surprising ones” (Stokes, 2006, p. 5). For example, a teacher could ask his/her students to respond to the notion of an “anti-portrait.” The constraint would ask students to distill the most important characteristics and motives of portraiture throughout history and actively pursue opposite means and goals. Many stereotypical, superficial ideas would be avoided, and the number of original interpretations increased. In reexamining the purpose of a portrait, the students will “grapple with definitional issues [of art] or [re]consider the various roles . . . [it] has played” (Costantino, 2002, p. 219).

Goal constraints relate to “styles” (i.e., Fauvism, photorealism); subject constraints connect to the “content” of a work (i.e., self-portrait, landscape); task constraints deal with “materials and their use” (i.e., collage, impasto painting) (p. 8). “These tasks and materials constitute what it is that the student will need to ‘get smart about.’ Getting smart . . . means coming to know the potential of the materials in relation to the aims of a project or problem” (Eisner, 2002, p. 72). The art teacher has the most control over domain constraints. Interestingly, task constraints can help close the gap between the performance of students who are identified as gifted and those who are identified as less gifted (Ericsson; Sloboda as cited in Stokes, 2006, p. 12). Domain constraints, such as a limit on the number of pieces of paper that can be used for a collage, can help equalize opportunity for success and learning in a lesson. The term *handicap* is used in the context of many physical competitions; a competitor is purposefully (or strategically) placed at a disadvantage that makes his/her success more difficult. I wish to avoid any possible connection between the word handicap, as I have defined it above, and individuals with physical or mental disabilities. The same limitation will force students who are advanced in their thinking to work through or around any perceived “disadvantage,” while, at the same time, giving students who desire more definite direction a clear problem-solving path. Both groups of students – and all students in-between – will develop new knowledge. The implications for teaching are extensive.

“‘Working memory’ can handle approximately seven items at any one time (Stokes, 2006, p. 9). Cognitive constraints refer to limits of working memory, and the expertise one possesses in an area of knowledge. In making art, artists consider *many* things at once. Children especially find that to be difficult (Holzman, Pellegrin, and



Glaser as cited in Frederiksen, 1984, p. 381). Maximizing working memory to its full potential is one aspect of artistic mastery. Acquiring expertise makes managing large units of information more efficient; working memory is consequently less strained (Stokes, 2006, p. 9). Furthermore, as we will address later in Chapter V, the structures of cognition can resist ideation efforts.

Variability constraints refer to one's comfort level with doing something in *many* different ways; they "stipulate how differently [something] . . . should or must be done" (Stokes, 2006, p. 9). Variability requirements have two extremes: too high and too low. If the requirements are too high, then anxiety can occur. If they are too high – above the level of comfort previously mentioned – then boredom can result (Stokes, 2006, p. 10). An example might help clarify. One of my undergraduate professors was well known for many of his projects. One of these projects required students to complete 100 self-portraits. This relates back to the quote already presented from Stokes (2006), which described the need to vary the way one does something, rather than simply what one is doing, to make creative discoveries. After perhaps as few as 4 to 10 of a student's first attempts, he/she would begin to stretch the parameters of what a self-portrait can be, what forms it can take, and what layers of meaning it can potentially convey. Imagine what learning occurs in the last 10 to 20 of the 100 "self-portraits." The very definition of *self-portrait* must eventually be deconstructed and reconsidered. The search for some new definitions "is itself a new goal constraint [emphasis removed] (Stokes, 2006, p. 22). "Given enough skill," Stokes (2006) asserted, "and a high enough variability level, painting the same subject [over and over again] pushes the painter to someplace new" (p. 47).

I think of the work of Giorgio Morandi and Chuck Close as further examples. Morandi painted the same still life repeatedly; Close consistently made the frontal “mug-shot” his primary form. With repetition, the bottles, cups, faces, etc. fall away from focus and the *manner or style* in which they were painted becomes the subject of the paintings, their content. Stokes (2006) suggested that to promote high variability, tasks should involve many steps, or multiple factors to consider, with opportunities for variation (p. 10). With this in mind, an art teacher’s potential “limit” on a project could be the following: Use wire to draw a person’s portrait in space (refer of Alexander Calder’s small wire figurative sculptures), trace the shadow the wire portrait casts onto paper, and, finally, paint the distorted drawing with very realistic textures. Or, as another idea, have students drawing a still life draw everything they *cannot* see (behind, underneath, or above).

Limitations imply problems; problems suggest problem solving. Runco and Nemiro (1994) noted that “some researchers look at creativity as a special type of problem solving, while others view problem solving as a special type of creative performance” (Discussion section, para. 4). Either way, one has to wonder from where these problems come, or how this problem-solving behavior is learned. “When formally trained, novices master constraints in an order determined by others, teachers, coaches, critics” (Stokes, 2006, p. 8). An art teacher imposes certain creativity constraints on art assignments until students learn to impose their own generative parameters. We will cover *problem-finding* very soon. “Students should not make *all* [emphasis added] the decisions. Classrooms that are entirely ‘open’ and unstructured are not conducive to creativity” (Cropley; Runco & Okuda Sakamoto as cited in Runco & Nemiro, 1994,

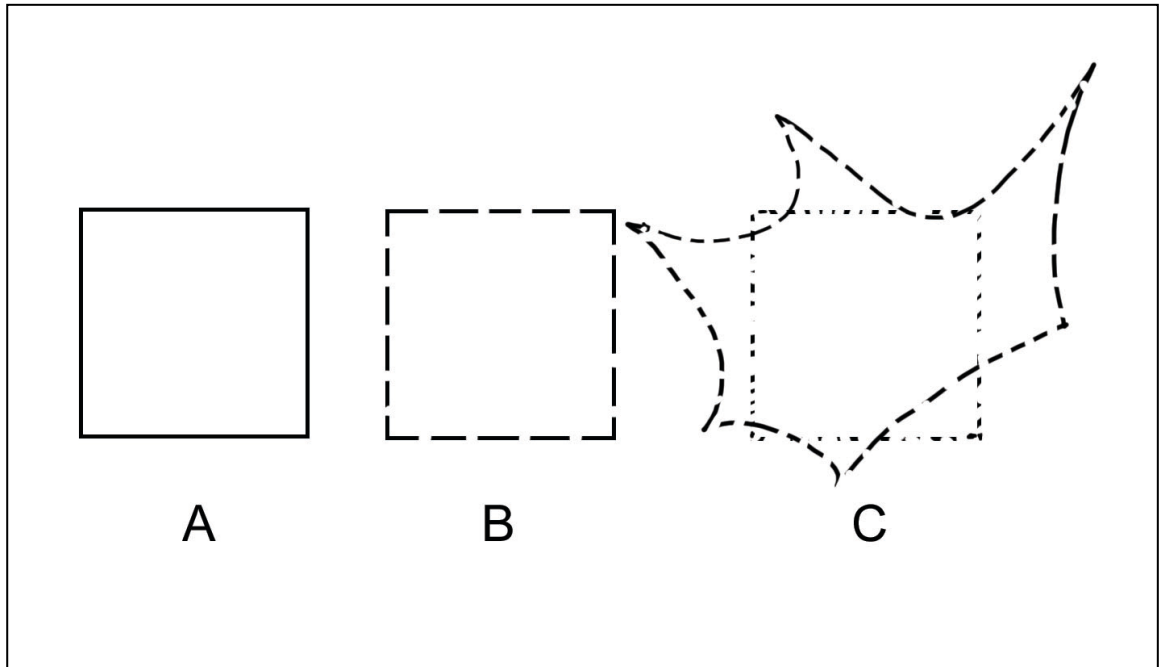
Techniques section, para. 2). The last quote, of course, must include a caveat. Like anything else, constraints can be taken to the extreme, or used for the wrong reasons. Parameters have the potential to be “full of . . . conformity and creatively debilitating” (Sapp, 1997, p. 287). Restrictions to students’ creative processes should never be utilized “for the sake of management” (Sapp, 1997, p. 283). Sapp’s reference to “management” can reasonably be expanded to include smooth behavior management, easy, systematic grading, or the achievement of predictable products or a high level of overall quality for student projects. This might take the form of a primarily product-oriented lesson: second graders use a limited palette of two colors and follow teacher instructions step by step to create “clean” or “neat” paintings of Matisse flowers as gifts for Mother’s Day or the upcoming art show. The art teacher who explained this lesson to me cited two reasons for the design of the lesson: the undesirability of “muddy” colors, and pressure from administration, other teachers in the school, and parents to create pleasing art products. This sort of lesson would most likely inhibit creative thinking excessively.

As an alternate scenario, a choice-based art teacher guides the daily activities in his/her room with themes or inspirational objects. A possible theme could be “opening and closing.” Students could interpret the theme in very different ways: the opening and closing of a window (more literal), or sunrise or sunset (less literal), to provide two examples. Additionally, when a student is encouraged to develop his/her own idea – perhaps through different mediums – spanning multiple artmaking sessions, his/her concept forms a self-imposed constraint. At the elementary school level, I discovered that time for end-of-session reflection for students is very beneficial. During “Art Talk,” a selection of students in a choice-based after-school art program presented their

ideas/work to the whole group at the end of each day of making. The presenting and re-presenting of art in progress motivated students to advance their ideas to higher levels of thinking, and their products to higher levels of quality. The process of refining their ideas, changing the forms of their art, and layering materials over time deepened the students' understanding of art.

### **“The Box”**

Earlier I used the word “stretch” to describe the behavior of an individual as he/she encounters parameters and works through them. The object of parameters is to stretch a student's voice, not to change it. They should encourage the expansion of thinking, not the manipulation of it. Boxes have obvious negative connotations of confinement, containment, and, in some cases, claustrophobia. In the most basic sense, a box describes a volume in space. Does a box have to be solid or opaque? As the title of this document implies, a box can be permeable, translucent – even transparent. Conceivably, it can also be elastic in material. For the purposes of our discussion, a box can be thought of as a loosely delineated *space*. This connects to two germane terms pulled from an article by Frederiksen (1984): *task environment* and *problem space*. The combined features of the task environment and the problem space represent a problem. The task environment is “the structure of facts, concepts, and their interrelationships that make up the problem.” “The problem solver's mental representation of the task environment” is what is known as the problem space (p. 367). Similar to relationship between the physical world and perception, the latter is one human being's understanding of the former.



*Figure 6.* Stretching the Box. A constraint initially seems constricting (a). With time and experience, one *begins* to see opportunities for free exploration within the parameters of “the problem” (b). In the final phase, one ceases to see the “box” as restrictive; one’s flexibility of thinking allows for focused, yet uninhibited exploration.

Sapp (1997) created a few simplified diagrams of the dynamics between parameters and the problem solvers who work within them. Inspired by the way his abstract diagrams help illustrate the complexities of human thought, I designed my own to show the ideal development of one’s problem space format (see Figure 6). In three stages, the perceived restrictiveness of project constraints becomes more free and productive. The parameters remain constant; it is one’s perception of the parameters and their purpose that changes. In the beginning, (Figure 6a) the limitations appear to be solid, unforgiving, uncompromising. In this stage, the barriers feel foreign, and the immediate impulse is to reject them. For some, a mild case of creative claustrophobia may form. Moving past the first pangs of frustration and/or fear, (Figure 6b) a student – with teacher encouragement – tests the fences, metaphorically speaking. He/she is

coached to look for weaknesses in the parameters, openings for clever, unexpected solutions. It is about “testing parameters rather than just defining problems in terms of limitations” (Sapp, 1997, p. 293). The solid lines delimiting the problem space retain their general structure, but convert into dotted lines. More opportunities than limitations can be sensed. We are really training students to think of ways to bypass “the problem” with persuasive arguments, to consider tangents, and to be clever and expand “the box” to its breaking point. In the final stage, (Figure 6c) we see the other side of the bottleneck – open possibility. Maximum stretching of the parameters occurs as the space created by the parameters functions as a launch pad for confidently divergent solutions. Having students “stretch” the parameters of a problem is “sometimes the response that teachers most desire” (Sapp, 1997, p. 293). The “box” maintains a residual presence, but the new perimeter of the problem space is free-form and based on the full individuality of the student. Here we see the goal of artistic problem solving, and the other varieties of problem solving for that matter.

### **Ownership of Parameters**

The beauty of problem solving is that the solutions will be as individual as the problem solver. Stokes (2006) stressed that “the same constraints in different hands lead to different things” (p. 13). She also elaborated on the origin of an artist’s voice: “The idiosyncratic ways in which [task constraints/conventions] are met and modified generate what is called the individual’s ‘voice’” (Stokes, 2006, p. 14). Perhaps the maneuvering of parameters has more to do with an artistic style or voice than complete freedom. More to the point, it is a type of freedom: “a ‘controlled freedom’ (p. 114), in which students are encouraged to find and solve problems within flexible parameters set by the teacher”

(Runco & Okuda Sakamoto as cited in Sapp, 1997, p. 294). Let us expand on the important topic of flexibility.

First, like any educational activity, individualization is indispensable. Sapp (1997) advocated flexibility with problem parameters—to not be “rigid” in assigning the same parameter(s) to every student in the class. “Responsive[ness]” on the part of an art educator has been advised (Runco and Okuda Sakamoto as cited in Sapp, 1997, p. 294). According to Sapp (1997), flexibility can be exercised by the art instructor as he or she “var[ies] the parameters of the problem from student to student,” (p. 290) but not after the process has been set in motion. Careful planning is required. The restrictions should not be modified—either dissolved or compounded—by the instructor after the lesson has been initiated. One should try to avoid “reactive’ planning (p. 290). Similar to changing the rules of a game mid-way through, “inconsistency . . . causes a great deal of confusion[,] . . . [and] instills in students a sense of helplessness” (p. 291). One wants to prevent students from having this kind of internal dialogue: ‘I don’t need to work within these restrictions. Every time I feel like I’m getting somewhere, and moving toward an original solution, the teacher interferes and prematurely changes the assignment.’

It is generally supported that when students ask their own questions, they are more motivated to pursue answers to them. The same belief can be applied to setting up of a problem for artistic investigation. A teacher can leave parameters partially unfinished, or “incomplete.” As long as “both the teacher and the students are aware that the parameters are incomplete,” the students can “as a class, in groups or individually” finish the “definition of the parameters” (Sapp, 1997, p. 294). Even after given a chance to provide input on the nature of the constraints for an assignment, some students will—

at least initially—spurn them as asphyxiating strictures. Some of this may have to do with students’ prior experiences art class and other classes. Art teachers should be aware of factors that impact students’ attitudes, and can lead to their resistance to lessons with constraints: students’ previous art education experiences; influences from friends and family; their desire to remain in a comfort zone of the use of known methods / materials for likely “success”; and their negative reaction to parameters that may be too broad, or “ill-defined” (Sapp, 1997, p. 292-293). Some students will reject or ignore the teacher’s parameters to engage “their own expressive agenda” or self-imposed parameters (Sapp, 1997, p. 292). Ideally, the art instructor should allow a degree of “latitude,” but encourage the student to *merge* the teacher-created parameters with his/her own (Sapp, 1997, p. 292).

It should also be noted that parameters, or constraints, tend to “proliferate” (Stokes, 2006, p. 5). Constraints are naturally “generated . . . from one transformation of the problem to the next” (Reitman as cited in Stokes, 2006, p. 5). Stokes (2006) has called this process the “cascade of constraints” (p. 6). The art educator must use finesse in guiding the waves of constraints that the first constraint(s) (teacher-originated) propagated. An art teacher might stipulate that a student must develop his/her ideas toward a specified theme, but that student may still choose to limit him- or herself further. He/she might, out of preference, limit the color palette or decide to only use appropriated imagery from the 1930s. In becoming more specific and more resolved, a work of art takes on more constraints.

I have suggested that creativity may be mostly about one’s attitude. Constraints are not limiting. The earlier students realize that the better. The bottleneck



compresses and then releases to its own world of possibility. Sapp (1997) explained this well:

Students simply may be uninformed or unaware of the scope of creative alternatives that are possible within the parameters of a problem. In this instance, students may be motivated to explore, but are unfamiliar with the level of freedom defined by the problem parameters. A teacher facilitates creative exploration if he or she makes students aware of the parameter elements of a problem as well as the infinite possibilities within parameters. (p. 293)

Sapp's words link back to the final stage of the student-to-parameters dynamic. The parameters defined for a problem are not designed for "right" or "wrong" solutions; rather, they define a space for conceptual play and purposive experimentation. The importance of instilling this attitude cannot be understated.

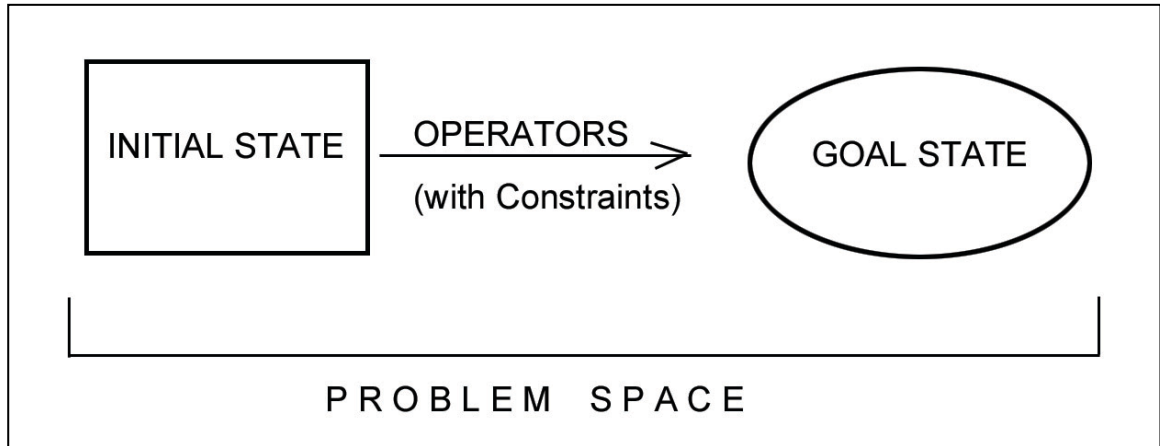
CHAPTER IV  
THE NATURE OF PROBLEMS

**Problem Theory**

John Dewey believed in the incredible potential of the problem to bring about, sustain, and propel learning: “The most significant question which can be asked . . . about any situation or experience proposed to induce learning is what quality of problem it involves” (Dewey as cited in Costantino, p. 225). *Open-ended* and *closed-ended questions* are terms with which many are familiar. Closed-ended questions target certain answers, while open-ended questions are *open* to a wide range of responses. When discussing the qualities of the problem, one deals with comparable classification.

Earlier, the term “problem space” was introduced. Before Frederiksen’s 1984 article, “Newell and Simon (1972) use[d] the term . . . to describe the internal response to a stimulus situation” (as cited in Kay, 1998, p. 265). The perceived *structure* of problems within this problem space largely determines the actions of the problem solver that will follow. Stokes (2006) outlines the essential elements of the problem space (see Figure 7):

A problem space has an initial and a goal state, a set of operators (condition-action rules of the form, “If this condition, then this action”) that are applied sequentially to move from the initial to the goal state and a criterion for knowing when the goal is reached. (p. 4)



*Figure 7.* The Essentials of Problem Space. One’s mental representation of a problem consists of his/her perception of where he/she currently is, and the state he/she has as a goal. Constraints can help direct activity in a purposeful way toward the goal state.

### **The Structure of Problems**

Various terms have been coined in reference to the overall character of the problem space: structured vs. ill-structured, presented vs. discovered, and reproductive vs. productive. Recall the distinction that Frederiksen (1984) made between the task environment (objective reality) and the problem space (subjective perception). As we will discuss soon, one’s perception of a problem is what influences his/her behavior. To illustrate, the sky is not “blue”; it is the result of the visible spectrum of light as it is filtered by Earth’s atmosphere; it also changes based on time of year, the seasons, the current weather activity, one’s location on the planet, the time of day, and the sensitivity of one’s eyes to nuances of color perception. Accordingly, an artist renders the colors of the sky as he/she understands them, and not as a spectrophotometer might read the data. A spectrophotometer might interpret the dominant hue of the sky to be blue-green, but if a painter “sees” blue-violet then his/her problem solving behaviors will be guided by that original assumption/thought. The same is true of any problem or question. “The solution

to the problem is directed by the choices made by the individual in his or her chosen definition of the problem” (Kay, 1998, p. 271). In that sense, it is important to ask the right questions. If an open-ended question is understood by one to be closed-ended, then he/she will be blind to the real, open-ended character of the question, and the methods of solution that that identification might have implied. This should be kept in mind as we continue.

Stokes (2006) and others have used *well-structured* and *ill-structured* to describe the nature of problems. Let us first address well-structured problems. “Everything in the problem space is specified”; “there is little search and, importantly, a single correct goal state” (Stokes, 2006, p. 4). Convergent rather than divergent thinking is emphasized (Zimmerman, 2009, p. 392). Also emphasized are consistency, speed, efficiency, and a preference for clear right and wrong answers. Well-structured problems are principally designed for “skill building” instead of for “self-expression” (Zimmerman, 2009, p. 392). Fill-in-the-blank worksheets, multiple-choice tests, many types of math problems, vocabulary test formats that encourage memorization, history tests involving exact dates, or the creation of an accurate color wheel are all examples of well-structured problem tasks. In contrast to well-structured problems, there are those that are ill-structured – the making of art potentially being a prime example:

Frederiksen (1984) asserted that most problems encountered in the real world are ill-structured. He voiced concern that educational settings are invested in the dissemination of presented problems. Students rarely have the opportunity to find or invent their own problem situations. The teacher gives the structured problem to students with clearly delineated steps toward a solution. (as cited in Sapp, 1997, p. 286).

Furthermore, Kay (1994) posited that skill, ability, and knowledge in problem solving do not necessarily translate into good problem-defining strategies/instincts (para. 3). This is

especially valid for well-structured problems. What degree of transfer occurs between the solving of well-structured problems (e.g., multiple-choice questions) and independent research in what Frederiksen called “the real world”? “Most students are not familiar with the idea of selecting their own course of study[,] . . . they [have] little experience in independent endeavors” (Kay, 1994, Step I section, para. 1, 3).

The “real world” is much more open – open to many possibilities, to error, and to alternatives or multiple “right” answers. It is unlikely in the real world that a “procedure [can] guarantee . . . a correct solution” (Frederiksen, 1984, p. 367). Eisner (2002) wrote: “The world students now live in and that they will enter into as adults is riddled with ambiguities, uncertainties, and the need to exercise judgment in the absence of rule”(p. xii). The arts invite the “explor[ation of] what is uncertain” (Eisner, 2002, p. 10). The arts can certainly reflect the full complexity of lived experience. As was previously mentioned, artmaking often entails much ill-structured problem solving. To elaborate, the problem space – in this case – is “incompletely specified. . . . The operators or the order in which they are applied may be unknown . . . [and there] could be no clear goal criterion” (Stokes, 2006, p. 4). What is important to point out here is that there could be, again, no set destination. There is usually no clear or precise end goal for a piece of art, no “desired state” to compare the piece’s current status to at any given time during the process. A logical/analytical “means-end” analysis” (Newell and Simon as cited in Frederiksen, 1984, p. 368) is rarely possible. In this “heuristic” process, “the problem solver repeatedly compares his or her present state with the desired state and asks, ‘What is the difference between where I am now and where I want to be? What can I do to reduce the difference?’” (Frederiksen, 1984, p. 368).

In fact, within the ill-structured problem space, one, two, or all three areas (initial state, operators, and goal state) can be unspecified. A teacher can set a goal, but allow students freedom of creativity to decide where to start and what their working methods might be. Or, a teacher might assign the materials and format (initial state), and provide a theme constraint (operator), but leave the desired result open. The teacher could also give students the theme constraint, and they would select their media/format and arrive at their own final solutions. If everything is predetermined and specified, where is there room for creativity? Stokes (2006) has appropriately asserted that “creativity is only possible with ill-structured problems” (p. 4). It may be helpful to distinguish constrained from well-structured problems. An art project, for example, can work within constraints and still be ill-structured. Later in her book, Stokes raised the idea of the ideal problem: “an ill-structured problem without a simple or single solution, a problem that can only be solved, resolved, with a series [emphasis removed] of solutions” (2006, p. 42).

Not being “simple,” ill-structured problems require more time than well-structured ones. Ill-structured problems “must continue to use slow processes,” but slowness is usually desirable in art (Frederiksen, 1984, pp. 391-392). There is pleasure in the search, the process – something we will expand on later. Consistency and repetition are notorious enemies of art. Eisner (2002) explained it eloquently: “The arts . . . have little room on their agenda for efficiency, at least as a high-level value. Efficiency is largely a virtue for the tasks we don’t like to do[.] . . . What we enjoy the most we linger over” (p. xiii). Also, as a mirror to the real world, ill-structured problems are “structured to accommodate multiple perspectives . . . and require working toward discovering the problem situation prior to pursuing a solution” (Kay, 1998, p. 271). With “opportunities

to formulate [one's] own problem," ill-structured problems often involve what is called problem finding (problem finding will be addressed in detail later in its own section).

Runk and Okuda (1988) summarized the ideas developed by Csikszentmihalyi and Getzels (1971); mainly, the coining of the expressions *presented problem* and *discovered problem* (p. 218). Similar to well-structured problems, presented problems are *presented* in close-to-complete form. They "are characterized as previously formulated with a known method of solution" (Sapp, 1997, p. 286). The opportunities for divergent thinking within presented problems generally involve ideation in response to the presented situation(s) (Runco & Okuda, 1988, p. 213). Discovered problems can be likened to ill-structured challenges. There is less "initial information"; the method/purpose is less "apparent"; and there is not "much agreement . . . concerning correct solutions" (Csikszentmihalyi & Getzels as cited in Runco & Okuda, 1988, p. 218). Discovered problems are newly *discovered*, and lack known or accepted methods for their solving (Sapp, 1997, p. 286). Problems of this type require "the ability to define a workable task" and "ideational productivity" (Runco & Okuda, 1988, p. 213). Much more ideation is required for discovered problems than for presented problems. And, in "defining a workable task," the problem solver must also identify and define the problem itself. An anecdote from Einstein will certainly further elucidate the texture of discovered problems: "For the detective, the crime is given, the problem posed: Who killed Cock Robin? The scientist must at least in part commit his own crime" (as cited in Getzels, 1985, p. 61). The scientist, or artist, poses his/her own questions, sets his/her own challenges.

Prior to problem solving, there is problem finding. But what takes place just before and during problem finding? We will touch on this subject now, but will cover it more comprehensively in the section titled Problem Finding. Runco and Okuda (1988) (as cited in Sapp, 1997) identified *problem identification* and *problem definition* (p. 285). For problem identification, there is a “recognition that a problem exists” (p. 285). One senses there is something missing, a missing piece, or a better way to do something. As identification transitions into definition, more specifics emerge. A problem’s definition “refers to the way [the] problem may function in a solution” (p. 285). “Problem definition assists in focusing the individual’s attention, energies, and gathered information on a specific set of circumstances or concepts” (Sapp, 1997, p. 284). First, an *opportunity* is perceived for new learning, better quality, a new technique, more efficiency, etc. Then a plan is developed to maximize that opportunity. Planning toward a solution occurs with both presented and discovered problems. Discovered problems must, of course, be identified or found, while presented problems are, for the most part, pre-identified. However, at times within the structure of presented problems, the problem solver will recognize *a problem with the problem itself*, or identify *more problems within the original* presented problem. How much of this occurs really depends on how the problem solver initially perceives the nature of the problem.

Earlier we established that one’s perception of the *problem space* determines how he/she will structure his/her problem solving strategy. A 1976 study conducted by Getzels and Csikszentmihalyi found that even when given freedom and ample time to choose from 27 objects to create their own still life to draw, some of the study’s participants “behaved as though they were in a ‘presented problem situation’” (as cited in



Kay, 1998, p. 273). Instead of ‘maximiz[ing] the discovered nature of the task,’ (as cited in Kay, 1998, p. 273) the participants assumed instinctively – perhaps having learned it from previous experiences – that more self-limiting was expected in the absence of definite instructor-imposed constraints.

### **Productive and Reproductive Thinking**

To ask original questions and develop new methods one uses what Greeno (as cited in Frederiksen, 1984) referred to as *productive thinking* (pp. 366). The problem solver responds to an ill-structured, or discovered, problem space with new theories, questions, and procedures. Perhaps there is no precedent – to borrow a term from law – and, thus, no pattern to follow, no model to look to, and no standard to guide. It could also be a new adaptation or extension of an existing question or method where “the structural properties of the problem representation [(problem space)] must be *reorganized* [emphasis added] or new features must be added” (p. 366). *Reproductive thinking*, on the other hand, involves the *reuse* or *reapplication* of something previously tried and tested to a new situation (p. 366). Reproductive thinking would likely be used in solving problems “that are clearly formulated, for which an algorithm is known, and for which criteria are available for testing the correctness of a solution” (Frederiksen, 1984, p. 367). It may be helpful to look at a definition of *algorithm*: a set of rules for solving a problem in a finite number of steps; a logical arithmetical or computational procedure that if correctly applied ensures the solution of a problem” (Dictionary.com, 2009-2013). Another connection can be made to the main difference between “arts” and “crafts” offered by Pitri (2003). The latter centers on “prescribed” products, while the former on shifting and “evolving” intentions (p. 23). Pitri’s words:

Teachers make a distinction between art and crafts. Crafts are based on the use of materials, but they have prescribed results. The products of art activities evolve as the individuals go along. Young children's art activities may not even lead to a finished product. An activity can start as a craft and evolve into art, if the child chooses to move away from the prescribed product. . . . Children who are engaged in art-related activities use the materials with an initial purpose or goal of creating, but not a prescribed product, and their efforts are not always completed. The process of artmaking is more important than the product because it could and should involve thinking and problem solving. (2003, p. 23)

The case Pitri has made is convincing. Makers of art must learn to function in that flow of receptivity, adaptability, uncertainty, and autonomy. Artmaking is effortful in its exploration of the partially-known and unknown.

As part of the artist's adaptability, he/she engages in productive thinking for novel situations. Snow (as cited in Frederiksen, 1984) explained two more valuable relevant terms: *crystallized intelligence* and *fluid intelligence*. The ability to perform with success to new situations requiring "extreme adaptations" of "performance processes" would be considered part of fluid intelligence (p. 380). It flows; it is not bound by a pre-programmed input-output system. "Crystallized intelligence represents previously constructed assemblies of performance processes retrieved as a system and applied anew in . . . situations not unlike those experienced in the past" (Snow as cited in Frederiksen, 1984, p. 380). Snow has also given us more support for the *slow and deep processes* for which artmaking can provide opportunities:

It is possible that the crystallized assemblies result from the accumulation of many 'fast-process' intentional learning experiences, whereas the facility for fluid assembly and reassembly results more from the accumulation of 'slow-process' incidental learning performance . . . with new or unusual instructional methods or content. (as cited in Frederiksen, p. 380)

How can a teacher better structure his/her classroom or art room for students' learning of the "slow- process incidental learning" that Snow mentioned? Practicing real-world

problem solving in, or as, lessons is one major answer. According to Frederiksen (1984), “instruction in the abilities that constitute fluid intelligence would be especially useful in preparing students to deal with the unique aspects of problems that are unlikely to be practiced in the classroom” (p. 394). Frederiksen’s statement supports the use of larger/longer, multi-step projects in school curricula. Problem-based learning is one potential model that can be adapted and used by art educators.

### **Problem-Based Learning**

In their 1988 study, Runco and Okuda “found that adolescents generated significantly more responses to discovered problems than presented problems” (as cited in Sapp, 1997, p. 286). Later, in 1991, Okuda, Runco, and Berger “found that their subjects responded more to *real-world* problems, which might be found in the natural environment, over presented problems *or* [emphasis added] discovered problems which required traditional tasks” (as cited in Sapp, 1997, p. 286). To rephrase it, real-world problems seemingly trump all other problem types in the level of student interest that can be achieved. While I agree that real-world problems are definitely more interesting than presented problems, I venture to say that complex and personally relevant discovered problems can be just as engrossing. The challenge is always how to set the stage for learning. Prensky (2007) suggested that teachers “think up interesting problems” and “let [the students] follow their own interests, learning things only as they become useful” (p. 2, 1). What Prensky wrote might lead some to believe that he wishes to reform curricular priorities and the teacher’s role in teaching; his goal is really to teach students adult researching and learning behaviors. Eisner acknowledged in his book, *The Arts and the Creation of Mind*, that some people feel art educators should practice *laissez-faire*

(hands-off) policy when it comes to guiding students' art content (2002, p. 46). The job of the art teacher is certainly not completely hands-off; it is really – as we have covered – a matter of strategic and limited influence/control. Sapp (1997) has suggested that it is best to switch off between structured (well-structured) and unstructured (ill-structured) assignments for maximum benefit to the teaching of a range of experience and ability levels in one class (p. 290). My photography professor in graduate school used such a structure. We had technical exercises (well-structured), as well as conceptual and expressive challenges for larger projects (ill-structured). Most of the time, the two types of activities took place simultaneously or with some overlap. Zimmerman (2009) has suggested a similar teaching practice using “convergent (structured) tasks for skill building and open-ended, divergent (unstructured) tasks for self-expression” (p. 392).

According to Eisner (2002), “. . . pedagogical skill is knowing how to set up a problem so that there is both space for personal interpretation and clarity of focus” (p. 55). He also wrote that “the teacher needs to behave like an environmental designer, creating situations that will, in turn, create an appetite to learn” (2002, p. 47). I appreciate Eisner's use of the word *appetite*, which brings to mind some words from Dewey: “educative experiences beget more educative experiences, propelling students to life-long learning” (as cited in Costantino, 2002, p. 225). Eisner has urged teachers to “design [their] curricula around the forms of cognition and understanding [they] want . . . to develop” (2002, p. 38). With “deliberately designed tasks[,] . . . [educators] design educational programs . . . to improve the ways in which students think” (Eisner, 2002, p. 13). If a teacher desires the learning of his/her student to have wide and versatile transfer, he/she needs to design lessons and assignment accordingly with built-in space for the

accumulation of “incidental learning.” This incidental learning is most likely – to some degree – of a problem-solving nature; the transferability of skills and techniques in problem solving is undeniable.

“It falls to those of us in education to try to *design* [emphasis added] the situations in which children’s efforts become increasingly more sophisticated, sensitive, imaginative, and skilled” (Eisner, 2002, p. xiv). Kay (1998) has provided four key ingredients that these designed situations should employ: *flexibility*, *fluency*, *elaboration* and *originality* (p. 281). In what she has called “elegant problems,” there is flexibility to engage every student (interests, ability level, etc.); there is “the opportunity for many choices of responses and solutions” (fluency); respect is given to students’ elaboration of ideas – many of which are idiosyncratic; and divergent, or original, solutions are given adequate space to develop (p. 281). As Kay has noted, “an elegant problem elicits elegant solutions” (1998, p. 282). Care taken by the teacher to thoroughly consider the potentiality of his/her “elegant” problem will be returned in the form of thoughtfulness and personal investment on the part of the students.

Now we arrive at the thought that ended the last section: What lessons can the art teacher take from problem-based learning? Sometimes abbreviated as PBL, problem-based learning was actually first developed in medical schools during the 1950s and 1960s. Student learning was centered on assigned medical cases that were investigated and researched in “tutorial groups” (Costantino, 2002, p. 221). Eventually, PBL spread to other college disciplines such as art history, chemistry, mathematics, and biology. It then spread to secondary schools (Costantino, 2002, p. 221). Problem-based learning “is an inquiry-based method that organizes the curriculum around ill-defined problems that

reflect real-life situations” (Costantino, 2002, p. 222). The problems that form the anchor point of such units “are often derived from historic or current events and may reflect those typically encountered by professionals in their fields” (Costantino, 2002, p. 222). Problem-based learning “requires extensive planning by the teacher to ensure that required content and skills are being covered” (Costantino, 2002, p. 222). It is important for the teachers to realize that PBL units can be used “as an introduction or conclusion to a larger unit” (Costantino, 2002, p. 222). To apply these ideas to art lessons, we know that art students can experience the realities encountered by professional artists. Students are given the opportunity to build their confidence and strategies for their post-secondary endeavors. Students can become more aware of the contemporary possibilities for artmaking. Collaboration can fit quite naturally into the teaching structure. The art educator could use PBL lesson to conceptually brainstorm, and then scaffold the teaching of skills and techniques to support the brainstormed concepts. Or the PBL unit can serve as a complex summative assessment project, as has been, in fact, a common practice for art teachers.

The teacher’s responsibilities are those of a “tutor or ‘cognitive coach’ as students go through the iterative inquiry process” (Torp & Sage as cited in Costantino, 2002, p. 223). In some cases, a teacher will model his/her metacognitive thought processes for students. “The teacher’s role shifts from instructor to facilitator, living resource, and guide” (Jaquith, 2011, p. 17). In this way, PBL can be directly linked to Vygotsky’s sociocultural constructivism with its emphasis on “co-constructed” understandings and “the zone of proximal development” (Woolfolk, 2008, pp. 50-57, 375-380). According to Vygotsky’s theory, the student interacts with his/her “more capable peers” and the

teacher to co-construct learning. The teacher strives to design lessons to push students to achieve just beyond their current abilities, but not so far as to utterly discourage them. The zone of proximal development represents “the area where instruction can succeed, because real leaning is *possible* [emphasis added]” (Woolfolk, 2008, p. 55). In locating the zone of proximal development, the potential of a student is in consideration of “adult guidance . . . [and] collaboration with more capable peers (Vygotsky as cited in Kay, 1998, p. 263).

On page 223 of her article, “Problem-Based Learning: A Concrete Approach to Teaching Aesthetics” (2002), Constantino described the typical flow of actions in a PBL unit. The teacher first “presents the problem situation,” (p. 223) which might consist of a body of facts; data; or other raw, unorganized, information. Students then choose or “pinpoint” the “central problem” from “several core problems” (p. 223). Next, the teacher facilitates the students’ brainstorming. Effectively, students work to determine what they know and what they need to know. It is hoped that what Eisner (2002) termed *primary ignorance* (“knowing what you don’t know”) will help reveal *secondary ignorance* (“not knowing what you don’t know”) (p. 49). Perhaps the answers lie hidden in secondary ignorance. Then, organizing questions are developed and the research efforts are prioritized. Students are essentially “developing a conceptual map for their investigation” (Constantino, 2002, p. 223). This is self-management and planning for success at its best. Planning for a still-life drawing, painting, or photograph passes through similar stages. The raw data would be the collection of objects that can be selected for the still-life setting. The artist brainstorms by experimenting with different combinations of the objects, and the effects those combinations create. By selecting certain objects, the artist

determines which challenges of form and concept will be his/her points of focus. If a skill is in need of development, or the mixing of a new color must be perfected, those need-to-know aspects are addressed by the artist as he/she works toward his/her goal(s).

### **Arousal and Motivation**

Whether it is creating one's own still-life or deciding upon a new scientific hypothesis to test, there is pleasure in a problem – in its discovery and its solving. It seems that we – humans – are always trying to make sense of the world, to find order in chaos, and to give structure to our lives through rules. To live a life without a sense of meaning, or some sort of order or structure is not something most people are naturally inclined to do. One is emotionally *affected* by the problems in his/her life, and his/her ability to “solve” or “make sense of” them. As Runco and Nemiro (1994) have claimed, “All problems have an affective component. If they did not, they would not be perceived as problematic (and worth one's effort). Problems by definition have goals – usually referred to as solutions – and these are presumably what motivates individuals” (Problem Finding section, para. 17). Kay (1998) said it nicely:

Human beings like to solve problems. Our minds are capable of imagining the past and the present. We have the capacity to think about how the world might be otherwise. We are designers and problem solvers by nature, perfecting our tools, always looking for better ways to do and make things. (p. 105)

Furthermore, humans seek to find problems, even those problems that are not practically useful, or that could be potentially dangerous (Getzels, 1979, p. 169). Animals do not – as far we know – pose questions to pose questions; they most likely do not find pleasure in exercising their mental faculties by entertaining the play of new ideas (Getzels, 1979, p. 170).



Problems can elicit pleasure. Artmaking is pleasurable for the artist as he/she creates his/her own problem to solve. Viewing art is pleasurable as the viewer analyzes and experiences a work to determine what the work's message is and how it makes him/her feel. The complexity of the problem leads to the complexity of the artist's solution, which, in turn, leads to the complexity of the viewer's experience of the art. But, are there limits to the problems that can bring forth pleasure? Can the goal of "productive puzzlement," (Eisner, 2002, p. 84) for the viewing of art be taken too far? To rephrase, can the joy of the mysterious in art become lost in too difficult a mystery? To answer these questions, we will consider the writing of Winner (1982). "Art elicits pleasure by acting on arousal, that is, on a person's level of attention, alertness, or excitement" (Winner, 1982, p. 58). Winner (1982) explicated the arousal theory:

Aesthetic pleasure can be achieved either by an arousal 'boost,' a moderate elevation of arousal until an optimal range is reached, or by an arousal 'jag,' a sharp rise in arousal beyond the optimal range followed by the pleasurable relief when arousal is reduced. . . . An arousal jag is achieved through the use of patterns [(problems)] high in novelty, surprise, or complexity which cannot be immediately assimilated [(understood, solved)]. A complex pattern . . . elicits uncertainty in the perceiver, which is correlated with a sharp elevation of arousal. Because one of the fundamental human drives is to explore and thereby satisfy one's curiosity (Harlow, 1953, Piaget, 1963, White, 1959), the perceiver is then motivated to explore the pattern until it is understood. This assimilation and consequent resolution of uncertainty is accompanied by a reduction in arousal, which is experienced as pleasure. (pp. 58-59).

Problem finding (ideation) seems close to an arousal "boost," while problem solving (artmaking) and art-viewing are closer to arousal "jags." Depending on constraints active during ideation (if problem finding is treated like problem solving), problem finding can also create an arousal jag. In general, more complex patterns, or challenging problems, sustain arousal/attention longer than simple ones: "interestingness rises steadily until an optimal level of complexity is reached" (Winner, 1982, p. 61). "The urge to look at and

explore more complex patterns is,” according to Winner, “‘epistemic,’ that is, knowledge seeking. Moderately complex patterns stimulate the perceiver’s curiosity and elicit knowledge-seeking behavior, challenging the perceiver to explore until the pattern is understood” (1982, p. 62). Recall the zone of proximal development. Apparently, there is a similar zone of interestingness for a problem, beyond which the problem-solver’s (or artist’s) motivation wanes, and the art-viewer ceases his/her looking, feeling, and thinking. “Patterns . . . too chaotic ever to be understood . . . prove . . . neither pleasing nor interesting” (Winner, 1982, p. 61). This is true when “looking longer does not result in greater understanding” (Winner, 1982, p. 62).

There was a time in my childhood when I really enjoyed putting together 1000-piece jigsaw puzzles. Imagine the drop in my level of motivation to complete such puzzles if I began to sense that pieces were missing, or that the pieces from two or more puzzles had been mixed together. The realization of the impossibility of completion or closure would surely have eroded my interest in the activity. The identification of a problem carries with it the hope of an eventual solution. In the book *Poetic Closure: A Study of How Poems End* (2007), Herrnstein beautifully explains how games – with their set rules and restrictions – actually satisfy a very human desire for closure. When something achieves closure, it “concludes” and does not “merely stop.” (p. 2).

Herrnstein’s words will clarify:

The ringing of a telephone, the blowing of the wind, the babbling of an infant in its crib: these stop. A poem or a piece of music concludes. We tend to speak of conclusions when a sequence of events has a relatively high degree of structure, when, in other words, we can perceive these events as related to one another by some principle of organization or design that implies the existence of a definite termination point. Under these circumstances, the occurrence of the terminal event is a confirmation of expectations that have been established by the structure of the sequence, and this is usually distinctly gratifying. . . .

It would seem that in the common land of ordinary events—where many experiences are fragmentary, interrupted, fortuitously connected, and determined by causes beyond our agency or comprehension—we create or seek out “enclosures”: structures that are highly organized, separated as if by an implicit frame from the background of relative disorder or randomness, and integral or complete. Not only works of art are thus distinguished, of course; other events and activities, such as games, may exhibit the qualities just described. A game of chess or football has integrity and a relatively high degree of structure; it also concludes and not merely stops. (2007, p. 2)

These “enclosures” allow for moments of order and anticipation in a world that can feel arbitrary, and riddled with vagaries. Someone once said that through their painting, painters try to organize their worlds, or create new ideal, imaginary ones that are more personally satisfying. Clearly, poems and songwriting usually abide by the enclosures of form, style, and the desirability of a gratifying conclusion. The parameters an art teacher applies to a class project could be considered an enclosure. As has been covered, gradually the art educator’s parameters will be replaced by the parameters students decide to impose on themselves. The constraints students apply to their own work will also be enclosures. Enclosures bring organization to the activity; they bring a degree of order to disorder, and purpose to decision-making. And ordering can trigger further ordering: “not only does understanding yield pleasure, but pleasure can stimulate people to make further discriminations” (Winner, 1982, p. 65). Said in another way, “intrinsic motivation . . . may result from problem finding rather than elicit it” (Runco & Nemiro, 1994, Techniques section, para. 8).

### **Problem Finding**

“The unstructured, often spontaneous association of information and experience” precedes problem finding (Sapp, 1997, p. 284). Citing other studies, Sapp offered the terms “mess finding” and “data finding” to reference the period of human activity that

happens before the emergence of an idea, a problem, and the consequent purposeful planning (1997, p. 284). “The problem solving process . . . [can be thought of] as periods of unorganized and organized thought” (Kay, 1998, p. 272). Patrick (as cited in Kay, 1998, p. 272) likely used the terms *unorganized* and *organized* to refer to problem finding and problem solving respectively (p. 272). Though, I might add that problem finding itself is a move from “unconnectedness” and formlessness to organization. Perhaps a parallel can be drawn to the universe as Spencer (as cited in Arieti, 1976) has considered it: there is movement from ““an indefinite, incoherent homogeneity to a definite, coherent heterogeneity, passing through a series of integrations and differentiations”” (p. 409).

Artist Henry Moore sometimes began his drawings ““with no preconceived problem to solve, with only a desire to use pencil on paper and only make lines, tones, and styles with no conscious aim””; he continued his thoughtful play with lines until ““a point arrive[d] where some idea bec[a]me . . . conscious and crystallize[d], and then control and ordering beg[a]n to take place”” (Henry Moore as cited in Getzels, 1985, p. 56). In Chapter III, we discussed the anxiety the artist experiences as he/she “face[s] a blank canvas” (Getzels, 1985, p. 57). The artist finds his/her own questions to investigate. Getzels (1985) stated that “the creative scientist or artist is deeply and often primarily concerned with . . . the *problem of the problem* itself” (p. 56). A quote from Einstein (as cited in Getzels, 1979) has been offered in support of the importance of problem finding:

The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old questions from a new angle, requires creative imagination and marks real advance in science. (p. 168)

The formulation of a problem is “higher order thinking,” and, therefore, “effortful” (Resnick as cited in Kowalchuk, 1999, p. 14). Some individuals have asserted that “planning [is] a more significant aspect of problem solving than execution, which is more mechanical” (Anderson et al. as cited in Frederiksen, 1984, p. 377). Problem finding is a prime example of an ill-structured problem space. “The path of action is not fully specified or known in advance” – it is “non-algorithmic” (Resnick as cited in Kowalchuk, 1999, p. 14). Problem finding, like creativity considered as a whole, is not “linear” (Csikszentmihalyi; Szekely as cited in Jaquith, 2011, p. 18). It may be componential, but it is recursive, cyclical, and integrated. Runco asserted that “distinct stages may be defined, but recursive interactions among components must be recognized for a realistic picture of creative problem solving and problem finding” (as cited in Runco & Nemiro, 1994, Problem Finding section, para. 14). “Stages spiral continuously as the artist pursues the problem. In truly open systems, learners may revisit an idea or process repeatedly to explore deeper and develop mastery” (Csikszentmihalyi; Szekely; Hathaway as cited in Jaquith, 2011, p. 18). Not only do processes spiral and recur repeatedly, they can actually easily bleed into and mix with one another. Getzels (1985) posited that the finding of a problem is not as separate from its solving as some might believe: “problem finding and solving are not as discontinuous as [a] schematic account . . . impli[es]; they meld into one another, and the problem may be altered in the process of its solution” (p. 60).

To interpret Einstein’s words further, great questions are valuable, even if they do not promise immediate answers. Many of the questions that hold our attention with the most intensity are those for which definitive answers are very unlikely or perhaps impossible. To find a problem does not necessitate that the finder of the problem answer

or solve it. Great questions benefit “generations” to follow (Getzels, 1979, p. 170). One’s legacy may not be a groundbreaking discovery, but an original question. “The quality of a problem may in part determine the quality of solutions” (Runco & Okuda, 1988, p. 212); “the deeper the problems found and posed (and in due course solved) the greater the human achievement” (Bunge as cited in Getzels, 1979, p. 170). Said in a different – and more poetic – fashion: “The aim of the educational process in schools is not to finish something, but to start something. . . . One of the most important pedagogical tasks is to help students formulate something to say [or ask] that matters to them” (Eisner, 2002, pp. 90, 98).

Stated simply and powerfully, Eisner (2002) wrote that “Artistry consists in having an idea worth expressing” (p. 81). In art, “it is the presence of an intended message or need to present or represent a solution to a problem that motivates children” (Pitri, 2003, p. 19). The purposes of self-discovery and expression/communication motivate the artist. “Work in the arts is purposive,” according to Eisner (2002), “and the character of those purposes should receive far more attention than they do” (p. 52). After the initial idea emerges from the “mess” of potentiality, a complex interaction of problem solving and further problem finding ensues. The artist encounters those fundamental problems: “what their ideas should look like”; “find[ing] a way to represent an idea”; and which “symbols and concepts” to employ” (Pitri, 2003, p. 20). It is foremost a challenge of moving between languages. Children’s art does not indicate immature, undeveloped, or dysfunctional attempts to copy or imitate reality. Art is never a direct one-to-one conversion of perception (stimuli) to artistic media. It is really a problem of “translation” as “children attempt to represent . . . [their] understanding using a different language”

(Pitri, 2003, p. 21). It can be as seemingly simple as choosing which colors to use, or as multi-layered as building an effective aesthetic reflective of the artwork's aims. While he/she explores the answers to those questions, "conceptual problems occur . . . when the nature of [his or her] activity requires conceptualization in order not to be disrupted" (Pitri, 2003, p. 20). The student periodically pauses, reflects, and puts his/her problem into other terms – perhaps words – to advance to further, deeper activity. As well as working toward the larger goal of solving the found problem, the artist also tries to be aware of the possibilities those smaller solutions in his/her path might present. Eisner (2002) has described this process as "flexible purposing": the art teacher teaches students "how to yield to the emerging leads the arts provide in the process of their creation; one needs to learn how to relinquish control in order to find new options in the work" (pp. 52, 236). Flexibility is analogous to receptivity. "Problem finding is related to being receptive to ideas and responding to changes . . . in [the] environment" (Pitri, 2003, p. 21). Gude (2010) clarified this idea: "one must begin by surrendering to the process of making [by . . . ] paradoxically 'lighten[ing] up' and 'get[ting] serious' at the same time (p. 32).

The skills that problem finding – and solving – strengthen can best be understood as *masterful thinking* and *resourceful research*. First, we will open up masterful thinking, which can subsume terms such as self-regulation, self-efficacy, and executive functions: "Crutchfield (1966) speaks of a 'master thinking skill' which has to do with the 'ability to plan, organize, mobilize, and deploy [one's] repertory of specific skills in an optimal attack on a creative problem'" (as cited in Frederiksen, 1984, p. 388). The student believes he/she can accomplish the task (self-efficacy); he/she can plan what needs to be

done or learned to accomplish the task (self-regulation); and the student can analyze his/her own approaches to the problem to improve his/her strategy (executive functions, also known as metacognitive skills). One goal of education is to regularly “reflect on thinking in a systematic way” (Costantino, 2002, p. 227). Perhaps my favorite phrasing comes from Bartel (2012): a large goal is “to actively move students in the direction of *self-planning for creative thinking* [emphasis added]” (#7 section, para. 4).

In a lesson I taught involving the dismantling of small appliances to create original sculptures, the development of “self-talk” procedures was stressed. Problem solving/troubleshooting steps were internalized. The purpose was to increase the autonomy of the students as they constantly confronted new or complex problem situations (i.e., new types of screws/bolts, or different assembly styles used by manufacturers of the objects). Clean, algorithmic instructions would have been ineffective. Eisner presented a similar concept of self-regulation, which he called “internal monologues” (2002, p. 81).

“Resourceful researchers” know where and how to look for adequate information (Kay, 1994, Step II section, para. 4). They research an idea from multiple perspectives, and through different forms and formats of knowledge (e.g., expository text, novels, blogs). Perhaps these resourceful researchers “seek evidence to rule out as well as to confirm hypotheses” (Elstein et al. as cited in Frederiksen, 1984, p. 373).

The more often teachers can provide students training and practice in self-regulation and resourceful research (what adults do to learn), the more advanced their learning will be. To prepare students for the ambiguities and uncertainties of the outside world, “the desirable goal in the art classroom” is to transfer responsibility for problem



definition and finding to the students (Sapp, 1997, p. 295). Kay (1998) confirms that experiences in problem finding are required for an “advanced understanding of art,” and should be “made available” as early in child development as is realistically possible (p. 261). This should begin “on a small scale and progressively increase as the result of a developmental curriculum” (Kay, 1998, p. 105). “Providing students with experiences (early and often) that challenge them to be responsible for how, as well as what they learn, gives them the necessary skills for later success in high school, college, or in areas of their own interest” (Kay, 1994, Step I section, para. 4). As a result, students learn to “use resources, focus energies, do research, generate ideas, test possible solutions, and give visual form to their ideas” and meanings (Kay, 1998, p. 105).

Incorporation of more student choice in problem finding and solving may contribute to their “attitude of discovery” (Csikszentmihalyi & Getzels as cited in Runco & Okuda, 1988, p. 218). It is of consequence to know that individuality emerges in problem finding just as it does in problem solving (Getzels, 1985, p. 60). Students will have different interests and life experiences, so, naturally, they will have different questions. Part of the teacher’s job is to help reveal these interests and celebrate students’ prior life experiences. “Holt (1995) insists that everyone has interests and it becomes the teacher’s challenge to bring forth those interests” (as cited in Jaquith, 2011, p. 17). Because the artist is not hermetically sealed from the context that surrounds his/her artmaking (Gude, 2004, p. 193), personal history is inseparable from the questions that arise within a student. Kay (1998) made special note of this:

Two main factors influence the problem-solving [or problem finding] strategies used in any situation: the nature of the problem and the nature or experience of the problem solver. . . . The way individuals initially perceive a given situation or

problem is affected by prior experience. This prior experience directs the response. (p. 264)

No two responses – questions or solutions – will be the same. Every artist will innately magnify, or work to repress, his/her life experiences. Thought of as a whole, these accumulated memories constitute an artist's "background."

Many examples are available, but one readily comes to mind: Richard Serra. He was born in San Francisco, with its prominent maritime influences, and went to college in Berkeley and Santa Barbara ("About Richard Serra," 2001-2012). Around the time that he graduated with his BA in English literature, he began working in steel mills. He worked in steel mills for three years (O'Hagan, 2008, "Life in Brief" section, para. 2). Serra was not new to steel mills and shipyards; his father was a "shipyard pipe fitter" (O'Hagan, 2008, "Life in Brief" section, para. 1) and two of his uncles "worked on piers" ((O'Hagan, 2008, para. 20). "Serra's early work in the 1960's focused on the industrial materials that he had worked with as a youth in the West Coast steel mills and shipyards: steel and lead" ("About Richard Serra," 2001-2012). For some of his earlier works, Serra flung molten lead into the corners of rooms or where a wall met the floor. Currently, Serra works with incredibly large sheets of steel that tower above the viewer; these colossal works seem to challenge the laws of gravity with their gestures and immense weight. The sheets usually exhibit curvature – sometimes dramatic and at times subtle – which, in a very real way, connotes the form of a ship's hull. It is no coincidence that Serra's prior life experience surfaced in his art. As O'Hagan (2008) posited: "Where you come from confers meaning on what you do" (para. 20). "It's funny," film director Sydney Pollack remarked, "how it feels almost fragile the way people discover the things

that are so meaningful for their whole lives” (Taylor, Stevens, Ellis, Yamagata, & Goldman, 2006).

I believe the most original artists work from their prior and current life experiences. They find problems that could only come from their lives. How do educators encourage this inward searching? How can this be done in the relatively little time art educators have with their students? The significance of problem finding and its power to help create more successful, original artworks has been documented. In their study of artists drawing a still life, Getzels and Csikszentmihalyi (1966) concluded that:

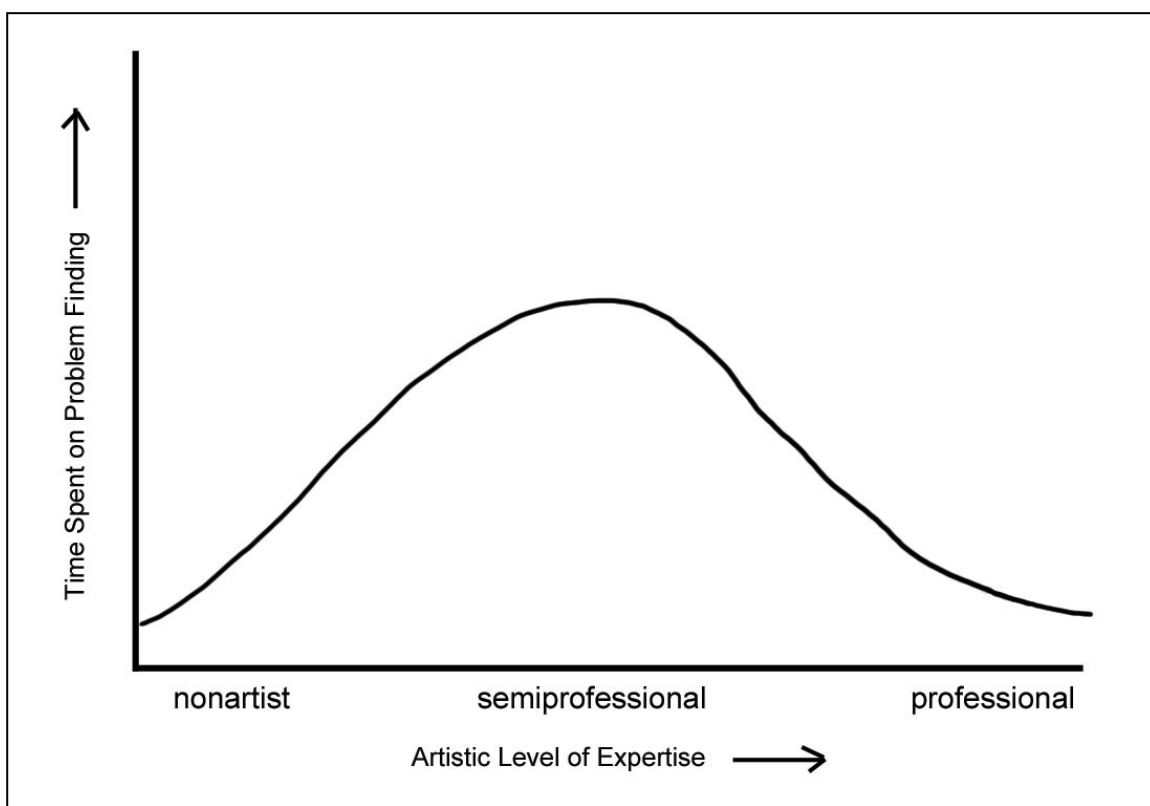
Drawings rated the most original and artistically most valuable . . . were the ones produced by students who had handled the most objects, explored the objects they handled most closely, and selected the most unusual objects to work with during the pre-drawing, problem-formulating period” (p. 34).

Also relevant here is what Kay (1998) found after analyzing the combined findings of Getzels and Csikszentmihalyi’s 1976 study and Patrick’s 1937 study. The time spent on ideation before beginning artmaking was compared between three groups: “professional artists,” “semiprofessional artists,” and “nonartists” (Kay, 1998, p. 274). The semiprofessional artists devoted the most time to problem finding, while the professional artists and nonartists spent very little time (Kay, 1998, p. 274) (see Figure 8). Kay attributed the shorter period of problem finding of the nonartists to “inexperience.” The possibilities for art had not been fully opened to them; they relied on well-known conceptions. The professional artists spent less time finding ideas because they had developed a style or “personal aesthetic preference,” which constructively limited their searching (Kay, 1998, p. 274):

The artist’s personal aesthetic framework seems to form an organizing principle for professional artists’ perceptual information gathering and consequent thought processes. The aesthetic [emphasis removed] appears to guide the search for

specific information, providing a selective criterion within which one explores. (Campbell as cited in Kay, 1998, p. 274)

Primary, middle, and secondary students likely represent the semiprofessional and nonartist groups. The time allowed for problem finding and ideation needs to be adjusted accordingly, with *more* gestation time in most cases. These developing artists are becoming increasingly aware of the virtually infinite possibilities of art, but they have not fully developed their individual voices yet.



*Figure 8.* Simplified Graph of Artmaking Time Used for Problem Finding. The time one spends on ideation and problem finding activities before making art depends largely on his/her level of inexperience (nonartist), his/her openness to many different possibilities (semiprofessional), and, eventually, the “style” or aesthetic preferences he/she has developed. Semiprofessionals spend the most time searching before committing to an idea.

“Problem finding can be a lengthy activity; however, when students feel autonomy, much of preparatory thinking can occur outside of an art class” (Jaquith, 2011,

p. 16). Can ideation be done as homework, either primarily or partially, to leave more class time for production? Ideation activity can function well at home. Teachers can guide larger, more complex and ambiguous searching (problem finding) with smaller, more manageable phases. These smaller, more focused tasks can be assigned as homework. Although these smaller tasks are more direct, they should not excessively control or influence students' ideas, which would corrupt the goal of the larger searching (Bartel, #8 section, para. 1). "Boundaries between school art and home art" can be "erased" (Jaquith, 2011, p. 16). This is an interesting proposition to ruminate on as we discuss cognition and ideation specifically.

CHAPTER V  
THE ORIGINS OF IDEAS

**Cognition**

Art is layered and multi-faceted. And while no singular layer or facet should be lifted too far above any of the others, art teachers might benefit from emphasizing art education for “cognitive complexity” just as much as they do for “creative self-expression” (Zimmerman, 2009, pp. 389, 394). In fact, I would venture to say that truly creative self-expression is an exercise in complex cognition. Art educators’ rationales for the importance of art certainly influence their priorities and decision-making in the classroom. Subsequently, much of the learning students acquire – and the depth of that learning – is determined by what the teacher chooses to emphasize. Through arts education, students should become aware of how special, how intellectually and emotionally demanding art can be.

One point of conversation that must be addressed is the concept of transfer. Transfer can be summarized as the reapplication of previously acquired knowledge in situations other than the ones in which it was originally formed. Citing the 1994 work of social scientists Lave and Wagner, Eisner (1999) acknowledged that some believe that the possibility of transfer is very narrow: “Learning or cognition . . . is *situated* and its utility is limited, more or less, to contexts like the ones in which it is situated” (p. 145). Yet, in his words, “some transfer must occur,” (p. 145) or else how could anyone function successfully in new or unfamiliar situations? How could knowledge be kept

quarantined? With ill-structured problem situations – as artmaking can very naturally become – multiple areas of the brain are activated simultaneously. This simultaneous activation promotes the integration of many ideas within the brain. To promote the interrelating of knowledge is a major goal of all areas of education, not just art education. We will cover more on this soon.

How is the knowledge capable of narrow or wide transfer stored in the mind? We can consult information-processing theory and Piaget's theory of cognitive development, and how both view long-term memory as an elaborate organization system (Woolfolk, 2008, pp. 279-288, 36-38). "Vast amounts of information," or knowledge, are organized into "schemas" or "schemata": "A schema is a pattern or guide for representing an event, concept, or skill" (p. 282). Woolfolk also called them "abstract knowledge structures" (p. 282). Rumelhart and Norman explained schemata as being "'packets' of specialized procedures that have been built up through experience[.] . . . A new schema is created by modeling it on existing schema and then modifying and refining it on the basis of further experiences" (as cited in Frederiksen, 1984, p. 377).

Not intended to oversimplify the human mind, and only for illustrative purposes, imagine the mind as an extensive, and constantly evolving, filing system. The files in these metaphorical cabinets are named with major and minor core concepts. Let us consider a memorable example offered by Arieti (1976, p. 410). If, for some reason, the belief that "all that glitters is gold" was formed in a person's mind and reinforced by later experiences, then one of the filing cabinet files would be named "All That Glitters Is Gold." The person whose filing system we are discussing is subsequently presented with three objects: a shiny gold bar, a gold coin painted blue, and a diamond. The shininess of

the gold bar would confirm, or reinforce, the current knowledge; it would be added to the file, and, according to Piaget's theory, "assimilated" Woolfolk, 2008, p. 38). But, perhaps the glint of the gold is not exactly the same quality of "glitter" that had been previously experienced and understood. A sub-folder within the larger one would be created to accommodate different glitter qualities. That would be a very small – again, in Piaget's theory – "accommodation" where "a person must change existing schemes to respond to a new situation. If data cannot be made to fit any existing schemes, then more appropriate structures must be developed" (Woolfolk, 2008, p. 38). The person then examines the blue gold coin. He/she knows the coin is gold because experts have certified it as gold. He/she can see that it is also blue, and that it *does not* glitter at all. Eventually, the person would realize that the concept of the blue gold coin cannot be assimilated. If, as is the case with the gold coin painted blue, the level "disequilibrium" (p. 38) is too high, then an entirely new folder, or a separate additional folder, must be created. Disequilibrium – and discomfort – results when new ideas cannot be successfully filed in the existing mental folders (p. 38). The original schema "All That Glitters Is Gold" would have to be revised as perhaps "Some Things That Glitter Are Gold," or "Not Everything That Glitters Is Gold." Not only that, but "gold" could be added to the "Blue" folder and "blue" to the "Gold" folder. By way of these large and subtle distinctions, "the system can expand . . . structure[s of memory] by self-generative processes" (Atkinson as cited in Frederiksen, 1984, p. 379). Put another way, the system is working constantly; it strives for higher levels of clarity and precision. It is truly amazing to contemplate how much sorting, comparing, assimilating, and accommodating the human brain does throughout one's life.



Most essentially, there is a process of connection, of analogy: the current situation is compared to what has been learned (Frederiksen, 1984, p. 377). Stokes (2006) has posited that “learning produce[s] . . . associations, between things in the world, between neurons in the brain” (p. 15). Woolfolk (2008) noted that “*priming* [emphasis added] may be the fundamental process for retrieval as associations are activated and spread through the memory system (p. 285). As presented by Woolfolk, priming is a consciously conceived effort on the part of a teacher to reactivate relevant prior knowledge just prior to introducing new information. Information is previewed in conscious and subconscious ways to spread the activation networks in the mind (p. 286), which later strengthens retrieval (2008, p. 285). “The more one bit of knowledge is associated with other bits, the more routes there are to follow to get to the original bit” (p. 285). Expanded and made more general, practically all “new” knowledge must first be primed. Priming is directly related to scaffolding in that previously acquired knowledge determines future learning; “What we already know [...] determines to a great extent what we will pay attention to, perceive, learn, remember, and forget” (Woolfolk, 2008, p. 269). One’s attention is highly active during periods of cognitive disequilibrium, but attention can also negatively affect learning by over-filtering (ignoring) stimuli that seem unnecessary or that cannot be connected to prior knowledge. One’s mind pays more attention to concepts that have grounding of any kind or extent in his/her current conceptual networks.

Earlier, in Chapter III, we touched on the limits of working memory, which cannot effectively hold or manipulate more than six or seven “items of information” at a time (Miller as cited in Frederiksen, 1984, p. 365). As we identified in the last paragraph, long-term memory has limitations as well; one of those limitations depends on priming,

on prior experience. If one *constructs* knowledge based on previous knowledge, then it is hard for one to “see” or learn anything that does not have some sort of connection or history with something already encountered or learned. Stokes (2006) wrote that “it’s hard to understand or ‘see’ anything that’s truly new – we don’t have the associative networks necessary to recognize . . . novelty” (p. 17). If a word is too unfamiliar, one does not hear it. If a something “seen” is too strange, it is – at least for a short period of time – invisible. This relates back somewhat to Eisner’s idea of secondary ignorance: there are times when one is not aware of what one does not know. Shortly, I will elaborate as to why this idea is important for brainstorming.

One of Piaget’s major conclusions from “his early research in biology” was that “all species inherit [a] . . . basic tendenc[y] . . . toward organization [emphasis removed] – the combining, arranging, recombining, and rearranging of behaviors and thoughts into *coherent* [emphasis added] systems” (Woolfolk, 2008, p. 37). It is desirable to make sense of the world, to find order in the chaos. But, this strong natural organization instinct can actually impede the generation of unexpected or irrational ideas during brainstorming. Prince (1967) explained the dynamic between these competing goals of the mind very clearly:

[The] conscious mind . . . is well organized and interconnected on a logical basis. . . . [It has a] desire to organize, to make rules of thumb and live by them. . . . The conscious mind tends to be inhibited by the very qualities that make it useful. It lives by the rules of logic; it resists “irresponsible” speculation. . . . The human mind is basically conservative. Any strange thing or concept can be threatening to it. When faced with strangeness, the individual tends to force it into an acceptable pattern or change his mind’s private geometry of bias to make room for the strangeness. (pp. 1, 4)

The rational or analytical mind is primarily limited to organizing for the speedy and efficient retrieval of relevant information from long-term memory. It also tries to name,

categorize, and normalize the strange in favor of the familiar. By five years of age, the building of the logical mind begins to inhibit the irrational/intuitive capabilities of its counterpart: the unconscious (Papanek as cited in Prince, 1967, p. 3). The conscious mind's overriding goals are predictability, routines, and safety. "Free to do anything, most of us do what's worked best, what has succeeded most often in the past" (Stokes, 2006, p. xii). Synectics and lateral thinking – two systematic creative thinking processes that will be explored soon – share the purpose of working against the normal goals of cognition. Lateral thinking, for example, aims to "broaden where to search for new ideas" and to "break current thinking patterns—routine patterns" (Lateral Thinking, 2013, para. 4). Frederiksen (1984) described it as deliberately working to "reduce functional fixedness" (p. 375).

I have worked as a picture framer for a number of years now; routines can be helpful, but mostly they are harmful to creative growth. After framing many pieces, one gradually and unconsciously learns which design combinations of frame and mats have the most success. For the purpose of helping customers quickly and efficiently, it helps to have this repertoire of pre-tested solutions that can be further customized based on the art that is being framed. However, I have treasured the times when a customer puts his/her trust in my design abilities, and allows me to take my time. Given the opportunity of more time, I will often consciously decide that I will create a design problem for myself. Sometimes I will pull a frame sample from the wall that I have never used before, or blindly select a mat from the mat rack that I will "work around." There are times I even imagine that I have been transported to a different time, or another country, and I make an effort to design from that time and/or place. When I have a few minutes for design

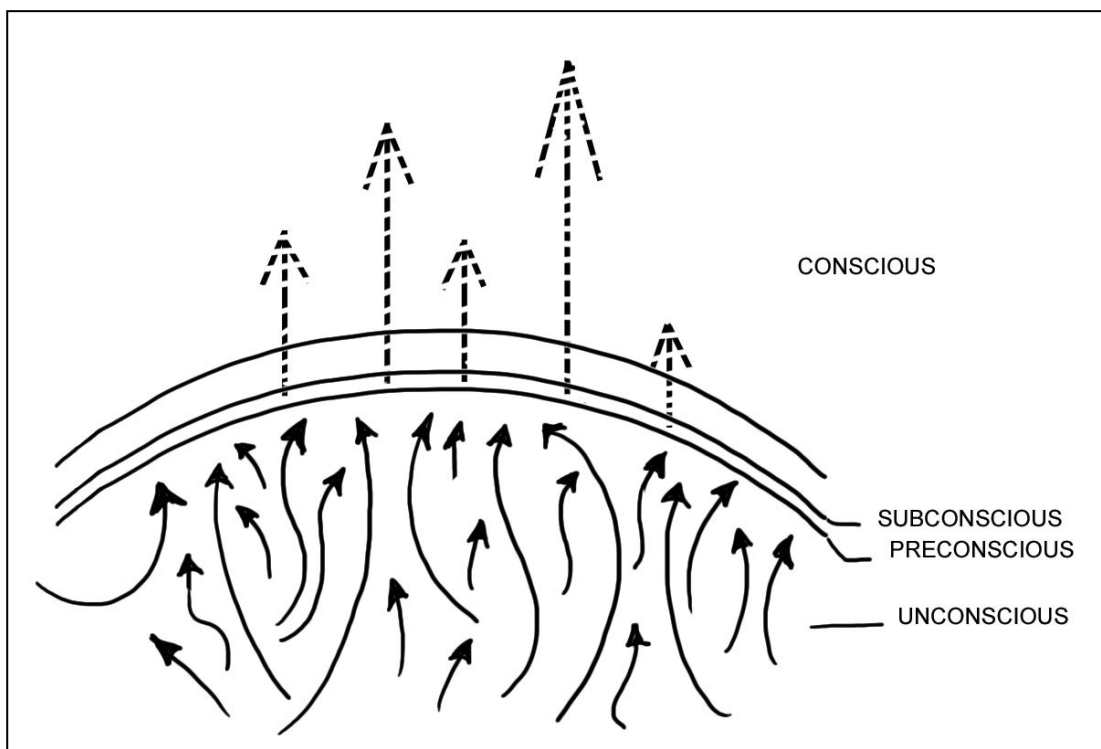
practice, I select an art or poster print from the store's prints, and playfully attempt to assemble for it "the worst framing setup possible," or I knowingly choose the exact opposite of what my conscious instincts tell me to choose. There are times when this purposeful play leads to surprising breakthroughs. Without the time and freedom to test some risky or unfamiliar designs, I do not move far beyond the fixedness of predictable success. The human mind seeks to make decision-making efficient and systematic, but the artist must counterintuitively reject this efficiency. The largest leaps that I have made in framing design and personal creative growth occurred when I threw a new element into the usual mix, and forced myself to adapt to it.

The account of my framing design practices should be a good preview of what is to follow: self-imposed restrictions, randomization, creative "what if?" games, empathy, and forcing a strange juxtaposition of concepts and images, to name a few. We will now survey some of the ways "art . . . fosters a willingness to be innovative and break out of old ruts" (Peckham as cited in Winner, 1982, p. 52).

### **Ideation**

We have identified the general character of the conscious (logical/analytical) and unconscious mind (illogical/intuitive). What barrier exists between them that prevents the free mixing of rational and irrational thoughts? Prince (1967) described this intermediary level of consciousness as the "*pre-conscious* [emphasis added]" (p. 2). According to his description, the pre-conscious functions as a "sensor" that filters the wealth of "interrupting" or seemingly irrelevant ideas that well up from "the unconsciousness" (p. 2). "There is strong evidence that the unconscious mind is a reservoir of information so vast and rich that it challenges the imagination" (p. 2). Only select thoughts from this

reservoir meet the logical “criteria” of the conscious mind and are allowed through the censor (p. 2) (see Figure 9). The goal is to “weak[en]” the censor filter that mediates between the unconscious and conscious personalities of the mind. The most creative people are, according to Prince (1967), more “responsive” to unconscious “impulses and intuitions” (p. 3). In his psychoanalytical stage theory, Kris (as cited in Frederiksen, 1984) explicated the value of the “incubation phase”: “the ego temporarily loosens its control of the thinking processes to permit a regression to a preconscious level of thinking where the ego is more receptive to drive-related impulses and ideas” (p. 385).



*Figure 9.* The Filtering of Unconscious Thoughts. Much of the wealth of potentially useful ideas from the unconscious are never allowed through the “preconscious” filter into subconsciousness and consciousness.

As de Bono (2013) has asserted, “Creative thinking is not a talent, it is a skill that can be learnt [*sic*]” (Lateral Thinking section, para. 3). “Deliberate effort[s] must be made

by the individual hoping to “capitalize” on his/her “creative capabilities” (Prince, 1967, p. 3). One does not have to wait for creativity to happen, or look forward to a spontaneous “Eureka” moment that may or may not come. There are ways to actively move toward it (Parnes, 1977, p. 462). Ideation activities involve brainstorming and fluency of mind – or the steady and strong flow of ideas. It is a matter of breadth of thinking. De Bono (2013) was absolutely correct when he wrote that “There is nothing more exciting . . . . . than thinking of a new idea[;] there is nothing more rewarding . . . . . than seeing a new idea work” (Lateral Thinking Workshop section, para. 1). Most of the forthcoming techniques are readily applicable to classroom practice. Kay (1998) appropriately concluded that “it is the processes involved in creative action that hold the greatest potential for educational research and translation to classroom practice” (p. 272). While some methods access ideas consciously and directly, others are more indirect – tapping into the unconscious via a pre-conscious made more receptive. All of these tools, or evoking mechanisms, attempt to jumpstart creative thinking; the jumpstarts – sometimes irrational, inefficient, or by chance occurrences – are followed by conscious thinking and reflection. The participant “jump[s] right in,” and then pauses at intervals for reflection (Gude, 2010, p. 36). When possible, the tools presented have been linked to the practices of historical and current artists.

Possibly the most important guideline to keep in mind as we consider various ideation procedures is that the *evaluation* of ideas as they are forming should be postponed. One should “defer judgment,” (Parnes, 1977, p. 468) or “suspend judgment” (Frederiksen, 1984, p. 389). Premature judgment can prematurely halt one’s progress to innovative concepts. No idea is too absurd, irrelevant, offensive, or incomplete. Mayer

(2006) mentioned that “a healthy disregard for the impossible” is beneficial (p. 2). “Wallach and Kogan (1965) stress[ed] the importance of an attitude of playfulness, rather than evaluation, when generation of new ideas is to be maximized” (as cited in Frederiksen, 1984, p. 389). To summarize, the stranger the ideas – the more out of the ordinary they are – the better they can open new possibilities within the mind. One can use “the *most outlandish* [emphasis added] [ideas] to move [his/her] thinking forward” (Lateral Thinking, 2013, para. 6). Prince (1976) wrote that the “pursuit of strangeness is . . . a conscious attempt to achieve a new look at the same old world, people, ideas, feelings, and things” (p. 5). To prematurely evaluate a concept is to slam shut some of these doors of possibility, so to speak.

### **Tools for Creative Imagination**

**Domain Constraints.** Working consciously through imposed and self-imposed domain constraints (goal-style, subject-content, and task-materials/processes) constitutes one of the more widely used methods artists use for the promotion of creative breakthroughs. The basis of a large part of this thesis, “The most inventive and expressive artists in the history of art consciously placed parameters around their creative problems” (Sapp, 1997, p. 283). Much of the theory behind their use has already been discussed, but how have professional artists made use of them? Like many artists, Edgar Allan Poe (1846) reported in his article for *Graham’s Magazine* that he began his work by thinking of a new goal of content and style. Poe based the creation of “The Raven” on the

consideration of an [intended] *effect*” (Poe, 1846, p. 163). Most artists begin with goals of creation, but where Poe distinguished himself was in the nature of his goals. In his words:

“The fact is, originality (unless in minds of very unusual force) is by no means a matter, as some suppose, of impulse or intuition. In general, to be found, it must be elaborately sought, and although a positive merit of the highest class, demands in its attainment less of invention than negation” (p. 166).

Poe’s use of the word *negation* is revealing; it implies a resisting or denying of poetry’s then-established conventions. He “sought” to apply existing patterns of rhythm and meter in original ways through their “*combination into stanza*” (p. 166). The refrain was repeated, creating a “monotone of sound,” yet he “diversif[ied], and so vastly heighten[ed], the effect” through his “continually varied . . . *application of the refrain*” (p. 164). Stylistically, Poe – from the outset – had the aim of working against some of the established “rules” of poetic construction.

He also had certain essential elements in mind as he began his work: the “beauty” that arises when the “objects [of art are] . . . attained through means best adapted for their attainment”; “truth, or the satisfaction of the intellect”; “passion, or the excitement of the heart”; but, most importantly, the “beauty [of] . . . the *tone of . . . sadness*[, or] . . . melancholy” (p. 164). In a form of backwards design, Poe endeavored to first find the *final* word of the poem, one that would have the desirable sound and tone to effectively conclude the work. “Nevermore” emerged as the solution, followed by the creature that would monotonously utter it – the “Raven” (p. 165). Considering the desired effect of beautiful melancholy, Poe reasoned that ““the death . . . of a beautiful woman is, unquestionably the most poetical topic in the world—and equally is it beyond doubt that the lips best suited for such a topic are those of a bereaved lover”” (p. 165). At that point, Poe had already arrived at his poem’s “*dénouement*”; it found “its beginning . . . at the



end, where all works of art should begin” (pp. 163, 165). “It is only with the *dénouement* constantly in view that we can give a plot its indispensable air of consequence, or causation, by making the incidents, and especially the tone at all points, tend to the development of the intention” (p. 163). Not every artist follows such an analytical process; but every artist does deal with the questions of what to make, and how to make it, before it can be made. The nature of those questions will undoubtedly apply some sort of limitations.

A more contemporary example of the use of domain constraints can be found in an unexpected place: the 2004 horror film *Saw*, directed by James Wan, with screenplay written by Leigh Whannell. What makes this film relevant to the topics of this thesis is not its genre, but how it was conceived through some very practical parameters, namely “limited [financial] resources” (Albin, 2010). The beginning of a very popular and profitable franchise, the original *Saw* came out of Wan and Whannell’s “frustration” as they tried to fund their first film project themselves (Otto, 2004). Wan explained the challenge: “After years of trying to get a film off the ground, we realized no one was [going to] *give* [emphasis added] us any money to make a film” (Otto, 2004). Whannell noted that, in retrospect, the limitations helped their process:

What’s the cheapest thing we can do? Two guys in one room with no windows. We’ll chain them up so they can’t go anywhere. We’ll keep them in this room. That’s cheap. That’s all we’ve got the money for. . . . If I [had been] given free reign, it would [have been] harder. So I actually think the restrictions we had on our bank accounts at the time, [and] the fact that we wanted to keep the film contained, helped us come up with the ideas in the film. It’s weird. I think restrictions can give you freedom sometimes. (Otto, 2004)

The “conditions” of the project (Albin, 2010) actually lead to the conception of the ingenious entrance of the film’s antagonist. Throughout the movie, the two characters,

which are on opposite sides of the room chained to the wall, probe themselves and each other with questions trying to figure out who put them there and why. In the end, it is discovered that the man behind the disturbing plan was actually in plain sight – in the room – with them the whole time; he had disguised himself as a dead body laying face down in the center of the room. Without the restrictions, would that simple, yet highly creative, plot device been possible? The ensuing sequels mainly developed the story behind and around the morally conflicted antagonist. As a side note, the conceptual problems sequels and prequels present are potentially useful for creative thinking. A sequel/prequel must present something new, but it must also fit into the story already created. I can see this being used as a project idea for an art project – perhaps a graphic novel. Another possibility is to explore a well-known story from the perspective of a character other than the original narrator or main character. The Broadway musical *Wicked* is an effective example.

Let us look at the practices of a few more artists. Stokes (2006) thoughtfully analyzed the work of Henri Matisse, Claude Monet, Jasper Johns, and Andy Warhol. Over his long six-decade career, Matisse's clarified a single goal that he had formed early on in his artmaking: "an art of pure color and line" (Schneider as cited in Stokes, 2006, p. 38). He progressed through a range of attempts until he arrived at cut colored paper, which represented the sought-after inseparable fusing of line and color (Stokes, 2006, pp. 38-41).

As described by Stokes (2006), Monet explored different potentialities of his original problem throughout his life (pp. 34-37). His "initial . . . ill-defined . . . goal was to present the world as a set of color relationships: this is how light breaks up, this is how

the fleeting moment looks” (Stokes as cited in Stokes, 2006, p. 34). Monet’s goal evolved over time (Stokes, 2006, pp. 34-37). He began with a constraint on value (contrast) as he worked to imitate the subtle effects of color *on* objects. He then further constrained his motif, painting many versions of the same subject in different lighting conditions. Because the identifiable subjects remained constant, the difference of color and effect between the different atmospheres became the true subject and content. Finally, the identifiable subjects faded away (or were constrained, precluded) leaving only the abstract play of “pure fields of color” (p. 36).

Johns and Warhol explored two sides of the same coin, as it were. “Johns [has made] *multiple* versions of overly familiar objects—targets, stenciled letters and numerals, the American flag—that force [one] to actively see, rather than merely recognize them” (Stokes, 2006, pp. 49-50). In contrast, Warhol emphasized sameness, “repetition and reproduction”; he intentionally reduced viewers’ perception down to “recognizing” and naming (p. 50).

Contemporary architect Frank Gehry has become well known for his creative vision. Architects must usually design through many practical and domain-specific constraints – plumbing, electrical, accessibility, and, of course, the design traditions, conventions, and “rules” of an influential establishment. Film director Sydney Pollack is a friend of Gehry’s. Pollack commented on his friend’s struggles as well as his own in a documentary on Gehry: “We’ve spent a lot of time together bemoaning the difficulties of trying to find personal expressiveness within disciplines that make stringent commercial demands” (Taylor et al., 2006). In the same documentary, Gehry himself said that “I grew up a modernist—decoration is a sin. That’s the mantra of modernism. So, if you can’t use

decoration, then how do you humanize a building? How do you humanize a thing? Materials could be expressive” (Taylor et al., 2006). For one project (The IAC Building, NYC), Gehry decided to self-impose a material constraint and create a whole building out of glass.

Public buildings are held up to public opinion, and the architect must somewhat adapt his/her vision to the needs and aesthetic of the community. When Gehry has been asked to design buildings for specific locations, he makes an effort to respect the neighboring buildings (Taylor et al., 2006). The proposed context for a building is a constraint; the architect’s personal desires for a project must be weighed against public reaction. Despite his efforts, Gehry’s designs are not always well received. His challenges to the domain have not yet made the transition from unfamiliar to familiar in the public’s eye. As with most things, people seem to have developed expectations for what an art form such as architecture is *supposed* to look like. Some would say that fine artists and architects have different goals and demands, and should remain separate. Another friend of Gehry’s, artist Ed Ruscha, recognized that he has been “aligned with artists” more than he has been with his architect peers. Gehry has visited art galleries, gone to show openings, “played with curved shapes,” and embraced the intuitive and organic risk-taking approaches to making usually associated with artists. He has also focused more on the *materiality* of his structures in addition to the visual look (Taylor et al., 2006). Ruscha noticed that “He mixes the freewheelingness [*sic*] of art with something that is really concrete and unforgiving, which is the laws of physics” (Taylor et al., 2006). Renowned art collector Michael Ovitz has referred to Gehry as “a

hyphenate,” meaning he has skillfully bridged at least two disciplines (Taylor et al., 2006). Gehry’s artmaking practice is an exercise in “hybridity” (Gude, 2004, p. 195).

Gehry does not just work through the constraints imposed on him by his discipline, the public, and clients; at times, he consciously *exaggerates* the given strictures, playfully taking limits to the extreme. He reflected on one such time:

It was by accident that I got into the fish image. My colleagues were starting to replay Greek temples. You know, the postmodern thing—the ‘80s. That was hot. Everyone was redoing the past. I said, “You know, Greek temples are anthropomorphic and three million years before man was fish. And, if you’ve got to go back, if that’s where you’ve got to go, if you’re insecure about going forward, and you’ve got to go back—dammit—why not go back three hundred million years? Why are you stopping at the Greeks? So I started drawing fish in my sketchbook. (Taylor et al., 2006)

Gehry, in effect, “restate[d] and broaden[ed]” the problem, which allowed him more options (Parnes, 1977, p. 467). Sometimes a problem just needs to be paraphrased (made more general), or the word choice changed, or maybe the syntax could benefit from rearrangement. For instance, the problem phrase “How do I draw a tree?” can become “How would a tree trace itself?” We will get more into the value of asking seemingly absurd questions soon. One does not have to immediately and unquestioningly begin work toward solving the problem one is given – or the one he/she has found for him- or herself. Perhaps the problem asks the wrong questions. Or perhaps the questions are important, but they are not the *most important* or *most revealing* ones.

**Phenomenology.** Curiosity about the natural world is rare in today’s highly technological culture, where everything is believed to be a click, email or call away, and all mystery is presumed dead. A healthy sense of curiosity is vital for creative thinking. As we will soon discuss, curiosity may be largely related to one’s questioning of assumptions. The philosophy of phenomenology asks one to consciously try to forget

what he/she *knows* about the world, to cease *naming* or *recognizing*, and start really seeing, hearing, tasting, hearing, and feeling again. Its goal is to recapture the excitement that occurs as new sensory stimuli are sensed, and just before they are assimilated for the first time. Said another way, it is “achieving [and sustaining] an intentionally naïve[,] . . . out of focus condition” (Prince, 1967, p. 5). Artists make the world special in many ways. Much of the artist’s power originates in his/her ability to *see* what others have learned to un-see, or do not take the time to appreciate. The phenomenological goal of seeing is to slow down the process of perception, to “avoid . . . rapid classification” of what one sees (Eisner, 2002, p. 68). “Inefficiency [of seeing] . . . is . . . preferable” (Eisner, 2002, p. 68). Artists regularly reclaim subjective phenomenal experience. Viewers of visual art are given opportunities to wipe away some of this “blindness,” to see and think anew. “If arts education is about anything,” Eisner (1999) asserted, “it is about helping students become alive to aesthetic qualities of art and life in the worlds in which they live” (p. 148). For example, to recognize a flower as a rose does little, if nothing, to enrich the viewer’s experience of that particular rose (Zurmuehlen, 1974). Simply labeling it as *a* rose, and not *that* rose, already does much to diminish both the uniqueness of the rose and the complex subjectivity of the viewer (Eisner, 2002, p. 76). Regardless of how common or mundane something may appear, it can be *found* again, discovered, and explored as if for the first time.

As part of a project, I would like to have my students describe a very "ordinary" object from *their* lives in the richest, most descriptive language they can (one solid page). Then, they could use their enhanced perception to draw, paint, photograph, or sculpt it. Almost like being asked to model something in three-dimensions before drawing it on

paper, the process encourages deeper awareness of nuance. “One might think that youngsters are unable to detect more subtle features of art, but research [has] show[n] that, if circumstances direct their attention, they can see much more than they notice spontaneously” (Perkins, 1987, p. 37). Seeing the external world with sensitivity, like the task of appreciating art at a high level of understanding, requires one to do more than simply “look and see” (Perkins, 1987, p. 37). Bartel (2012) explained that the task of seeing must purposefully be made more difficult for students: “As a teacher, my job is to make the hard stuff easy and to make the easy stuff hard” (#7 section, para. 1). In directing students’ attention and having them look at the world in different – or more complicated or difficult – ways, the art educator helps sensitize their powers of perception.

**Memory and Passive Knowledge.** As I travel from drawing table to drawing table in a hypothetical art room – performing the familiar conscientious art teacher steward rounds – I find one of my young students creating a self-portrait of herself standing in the rain. I am imagining this ninth grade artist pleased, with slight anxiety, to draw a formula self-portrait surrounded by stereotypical teardrop rain. Her representation stands stiff facing the viewer with the rigor of the ancient Egyptian aesthetic. The rain is rendered coming down in perfectly vertical streams, and the drops are systematically spaced evenly from one another. Where is that mysterious quality we call originality? Where is her unique perspective on the experience she has chosen to materialize?

It has been “theorized that the brain has a continuous recording device which stores all that one experiences” (Prince, 1967, p. 2). Viktor Lowenfeld (as cited in Saunders, 1982) used the term *passive knowledge* to identify the rich reservoir of

experiential detail that everyone holds dormant in memory until it can be recalled with directed purpose and reactivated in creative expression. Woolfolk (2008) referred to some of these vivid, sensory-based recordings as “episodic” or “flashbulb memories” (p. 284). This layered information is the gold nugget well worth eking out of every student. Saunter’s (1982) discussion of the Lowenfeld motivation was absolutely incisive when he linked the increasingly successful recall of more details from visual, haptic, olfactory, and auditory memory to aesthetic growth. And emotions and memories are necessarily tied to this sensory data upon encoding. Technical ability aside, the defining characteristic of art, as described by Zurmuehlen (1990) of Beittel’s “three essential conditions for making art,” is idiosyncratic meaning (p. 18). The unique life experiences of an individual are transformed by the mind as a source of art. The joy of fresh phenomena is reclaimed from efficiency-minded abstractions and stereotypical symbology.

Technical ability was mentioned earlier because regardless of expertise level in handling media, or degree of cognitive capability, one can tap (perhaps with a little guidance – we will discuss this soon) his/her plentiful source of one-of-a-kind perceptions. Students can be reached by art teachers and motivated to deepen their memory and awareness of their lived experiences. Lowenfeld’s questions to visualize, intensify, and “crystallize” (Henley, 1992, p. 76) mental visions help “free . . . the child of his or her . . . inhibitions about trying to draw or paint” (Saunders, 1982, p. 30). Instead, student artists can feel the empowerment that accompanies “artistic causality” (Zurmuehlen, 1990, p. 18). Lowenfeld used his motivations as focus exercises whereby the art teacher might create the opportunity for students to “extend their frames of



reference[,] and guide them from one stage of artistic development to the next” (Saunders, 1982, p. 28). According to Saunders’ article (1982), Lowenfeld was concerned with enriching children’s form concepts (p. 29) as “related to body parts (physical growth) or interaction between the child and others (human figure and social growth), or with the environment (spatial representation)” (p. 31). Lowenfeld’s *form concept* seems to refer to an encompassing *understanding* of an object, idea, or process. A Lowenfeld “motivation” begins with an inspirational or poetic phrase: “eating the candy”, or “I am running outdoors on a spring day,” or “brushing my teeth” (Saunders, 1982, pp. 30-31). The students are then guided with questioning (where, when, why, who, what, and how) to establish the “atmosphere” of their memories (p. 31). In my art room, I intend to use these questioning principles on a more student-by-student basis, stressing cognition over media manipulation.

With that in mind, let us return to the self-portrait in the rain. The mind is a magnificent synthesizer, capable of storing so much information (both raw and fully processed/abstracted), and yet requiring the right triggers or memory pathway chains for clear recall. The motivation process should move indirectly from questions first to establish the generalized atmosphere/setting to fine-tuning and requestioning (Saunders, 1982). Here are some possible questions to aid in bringing the student’s passive knowledge back up to the surface of consciousness, so that she might *elaborate* on the concept on which she has already set to work: “What time of day are you interested in capturing? How old are you in this self-portrait? What type of clothing are you wearing?” After the student answers the general queries, I could ask her to close her eyes to help eliminate distractions. Then, more questions: “Look up at the storming sky above: What

does it look like? What does the rain feel like as it lands on your face and clothes? What can you hear? Can you really see the falling water clearly, or only where it strikes surfaces? Can you mimic the sound and/or movement of the rain on the grass and pavement around you by moving your body?” (Lowenfeld suggested having students stand during physical reenactments to encourage large body movement (as cited in Saunders, 1982). “Do you feel more tickling on one side of your face than the other? What do you think that tells you about the wind, and its direction? What does the air taste like? Is the air inside your nose warm, cold, moist? Are you standing still or moving about? How fast are you moving? Do you feel heavy because of the water retained within and on your clothes? Do you feel water beading up on your scalp and running in quick movements tightly along the back of your head and down the channel of your spine? Shivers? Which parts of your body are shivering? Are your shoes wet? How wet? Are they making any strange sounds? How do your socks feel around your ankles? Do you feel protected or vulnerable in your rain clothes? What all are you feeling as you experience the rain?”

Many of the student artists I have had the privilege of teaching or assisting have jumped to popular schema when representing anything, even intensely personal sensations, feelings, and narratives. Truly, students of all ages need to be shown – through in class art motivations/interventions/visualizations if need be – the benefit for their creativity and personal satisfaction that relying on and fully trusting one’s own experiences and the feelings generated by those experiences can have. Eisner (2002) posited that “Art education should help students recognize what is personal, distinctive, and even unique about themselves and their work” (p. 44). It is thrilling to think about

every student's deep reservoir of unique life experience that is just waiting to be accessed. Even more, students can potentially find their own memories for the first time as they are freed from the labyrinth of connections within the brain. Frederiksen (1984) noted that "retrieving information stored in long-term memory can be viewed as a problem-solving activity" (p. 363). In the art room, questioning to elaborate and enrich, build up and crystallize, and layer and complicate, can be practiced. Ideally, students will internalize the process so that they will feel confident in reactivating passive knowledge within themselves whenever they feel it would be useful or pleasurable. Bartel (2012) has suggested that students maintain "idea books, journals, sketchbooks, question lists, diaries, reflections, [and] illustrated experiences" (#3 section, para. 2) to habitually explore their idiosyncratic life perspective. The purpose is to show students "how creative people develop ideas for their work," because they "are not used to the idea that they are to originate ideas from their own lives, experiences, and concerns" (Bartel, 2012, #5 section, para. 3).

**Free Association and Stream of Consciousness.** Learning creates associations or connections in the brain. Free association functions to map those broad association networks of ideas, to track a train of thought. We have already briefly covered the idea that the mind consists of virtually infinite interconnections of concepts or schemata. These concepts can also be thought of as *nodes*, which "represent . . . item[s] of information, or a cluster or *chunk* of related items" (Kinntsch; Rumelhart, Lindsay, & Norman; Scheider & Shiffrin as cited in Frederiksen, 1984, p. 364). Frederiksen (1984) described the spaces between nodes and how they contribute to the complexity of human thought:

Information may be highly organized into conceptual networks (Anderson, 1981b; Bobrow & Collins, 1975; Puff, 1979; Rumelhart & Ortony, 1977; Schank & Abelson, 1977) in which concepts may be represented as nodes, and lines connecting such nodes stand for meaningful associations between concepts. LTM [(long-term memory)] contains thousands of such networks, each with connections to other networks. Because of these interconnections, information other than that which was explicitly stored can be derived (Bower, 1978). (pp. 364-365)

“If some of the elements of the cluster are activated, all are likely to be activated”

(Frederiksen, 1984, p. 364). This is the principle behind the use of list making (the flow of the stream of consciousness) and mind mapping (spontaneous concept webbing). The participant in the process begins with a word or image concept. In a previous lesson of mine, I used sensory adjectives or verbs. Beginning with a word such as “abrasive,” the student would immediately – without overthinking or self-editing – write the very next word that came to them. The process continued as the student kept adding to the list by responding only to the item immediately prior. From one node to the next connected node, a chain of contiguous or related ideas was mapped. The process can continue to infinity, but not long after the stream of ideas has started, potentially useful points of investigation naturally start to present themselves. Further, one of these intriguing points can be pulled from the list, and used to start its own stream of consciousness list or graphic web organizer.

**Synectics and Lateral Thinking.** One usually thinks of problem solving as being a very focused, directed, practical mental activity. In working toward the solution, one has no time to entertain seemingly irrelevant or unfruitful possibilities, or to deviate too far off course. According to the synectics and lateral thinking processes, the opposite is true. More in the nature of sidestepping while at the same time always moving toward a goal, lateral thinking “is an indirect and unconventional” creative problem solving

approach (Lateral Thinking, 2013, para. 13). Horizontal thinking (sensitivity/creativity), rather than vertical thinking (analytical/logical), is emphasized (Lateral Thinking, 2013, para. 13). Perceived perhaps as inefficient, the ideation/problem-solving participant is taken at times off course to explore breakthrough possibilities; a detour gets one closer to his/her ultimate goal. The goal is to “disrupt persistent habits of thought and free [individuals] for new ways of thinking” (Peat as cited in Zimmerman, 2009, p. 395).

**Strange Analogies and Force Fit.** Parnes (1977) proposed that a “basic objective” of education in creative thinking is “getting . . . student[s] to interrelate more freely and effectively” (p. 473). Synectics “mechanisms [(such as analogy)] force . . . new ideas and associations up [from the unconscious] for conscious consideration” (Prince, 1967, p. 4). While actively suppressing the urge to judge, one uses an analogy to explore the conceptual area *between* seemingly unrelated ideas/objects (Parnes, 1977, p. 468). For instance, what possible connections could be drawn between *pear* and *submarine*? And, with that, the familiar has been made strange through an incongruous analogy (Prince, 1967, p. 4). One’s conception of *pear* cannot be separated from that of *submarine*. Through analogy, the meaning of each idea has been distorted, expanded, contaminated by its association with the other. Heid (2008) has developed a “synectic chart” that facilitates the forming of incongruous analogies (p. 44).

Generating thought-provoking analogies is the first step. However, the most important part of the analogy for the purposes of ideation is investigating the real possible relationships between the concepts. At some point, one must select one of their strange/irrational analogies, and attempt to bring it into the realm of the real. One must “refine strange ideas into useful ones” (Parnes, 1977, p. 471). Through “constructive

psychological strain,” rational points of connection are sought out in the potentially irrational analogy (Prince, 1967, p. 6). Then the strange must be made familiar (p. 4). Even if one initially sees an idea (or combination of ideas) as impossible, he/she should “fantasize it working” (Parnes, 1977, p. 470). The two ideas are forced to fit together; the force fit creates a conceptual problem to be solved. During the “solving” of the problem, even more potentially valuable questions – rather than solutions – arise.

Prince (1967) explained the purpose and use of force with insight:

“Although the analogical mechanisms lie at the heart of the Synectics method, they must be “force-fitted” to the problem if they are to be effective. Through the strain of this new fit the problem is stretched and pulled and refocused in order that it may be seen in a new way. If no deliberate attempt is made to find relevance in apparent irrelevance, then one analogy can merely lead to another and another, and potentially fruitful viewpoints will be by-passed. (p. 9)

In one version of the force fit, a keyword is selected that best encapsulates the problem at hand. Then, the search for a short two-word phrase is begun. This new phrase suggests “the essence of [the keyword’s] meaning” (Prince, 1967, p. 8). In the end, the “symbolic analogy” formed by the two-word phrase “often . . . embraces an apparent paradox” (p. 8). For example, the word “mixture” could have a symbolic analogy of “balanced confusion” (p. 8). “Insight usually arises” as one attempts to “resolve” the paradox (p. 8).

The force fit is used in visual-conceptual analogical problems as well. One prominent example is Ron Howard’s film project “Project Imagina8ion” (Radish, 2012). Members of the public submitted over 100,000 of their own photos. The hundreds of photos were reduced down to a final eight chosen by Howard. Each of the eight photos was given to one of eight directors who participated in the project. Along with the photo, they were given a one-word theme. The possible themes were discovery, character, setting, the unknown, backstory, relationship, obstacle, goal, time, and mood. Merging

the photo and the theme as a sort of visual-conceptual analogy, each director used the analogy as inspiration for his/her original short film. Howard thought of “Project Imagin8ion” as a “creative experiment” to launch new narratives (Radish, 2012, para. 4).

Another example of visual-conceptual analogical problem solving is the Thematic Apperception Test (T.A.T), a “projective technique” used by psychiatrists and psychologists (Thematic Apperception, 2008, p. 1151). As a projective technique, the T.A.T. involves test subjects responding “to ambiguous test material” to assist in measuring the test subjects’ personality traits, feelings, or attitudes (p. 1149). From a set of 31 “cards that portray human figures in a variety of settings and situations,” the subject is usually shown between 10 and 14 cards one at a time (p. 1151). Inherently subjective, the test requires the subject to subconsciously/unconsciously force fit his/her personal outlook with the ambiguous images on the cards. Psychological strain is experienced with each photo until a story, or a relationship emerges. The subject is asked to tell a story addressing the following items: “the event shown in the picture; what has led up to it; what the characters in the picture are feeling and thinking; and the outcome of the event” (p. 1149).

**Synesthesia.** The eyes see; the nose smells, the ears hear; the tongue tastes; the skin feels. But, can the eyes feel? Or the nose see? Synesthesia deliberately mixes up sense data to explore new ways of considering things one has come to know so well. Eisner (2002) described it as “the process of experiencing in one sense modality qualities that are found in a different sensory modality” (p. 86). The process generates new *language* that can potentially lead to new understandings, i.e., “razor-sharp blue-green,” or “the carpet felt silent.” Parnes (1977) proposed introducing into an ideation exercise

packages containing mysterious odors, and played samplings of music with “a ‘descriptive’ quality,” to promote the layering of mental associations” (Parnes, 1977, pp. 464, 467). Though not always a practical or logistically feasible option for the art classroom, the idea nevertheless points to the powerful influence music and other sensory stimulation can exert on ideation efforts.

**Verbs.** Painter Jasper Johns has reported that when he works, “he takes an object and does something to it, and then he does something else to it, and then something else” (Castleman as cited in Stokes, 2006, p. 50). Each time Johns performs an action on an object, the object becomes further removed from its original appearance and function. Verbs force continued and varied action on an idea. Verb flashcards could be developed and used with students to propel thinking on their ideas in a process of metamorphosis. Parnes (1977) offered two verbs: “magnify [and] rearrange” (p. 468). Bartel (2012) also listed some useful verbs: “choose it, improve it, shake it, pound it, deconstruct it, reengineer it, materialize it, test it, internalize it” (#1 section, para. 1). For illustrative purposes, let us consider a bar of soap. Imagine the following sequence of verbs (or actions) being applied to that bar of soap: melt, bend, freeze, carve, rub, scrape, contain, and soak. A verb list can definitely enhance the depth of artmaking’s physical process, but where it has the most profound use is with ideas. As an abstraction in the mind, an idea can be manipulated through very different actions virtually without limit.

As part of a project, it might be interesting to create lesson instructions with blank spaces for some of the verbs. Students could then decide which actions or processes would add the most meaning to their idea.



**New Perspectives and Reconsidering Assumptions.** Earlier in Chapter III, brackets were explored as a way to consciously change one's vantage point. "Frame of reference" is another term. Eisner (2002) defined it as "a frame that defines a point of view. We see what we see within the terms the frame provides" (p. 84). While Frank Gehry and his assistants are building a model for an architecture project, he periodically requests that the model be "reversed." He even looks forward to the times when his assistants misunderstand his instructions, and assemble his models incorrectly (Taylor et al., 2006). The reversal of a model or an error in assembly creates the opportunity for a new perspective.

Gehry has also innovatively reconsidered the physical materials used in building construction. What some might call "junk" or "ugly" he has elevated – through his divergent thinking – to high aesthetic value. For at least one project, he used chain-link fencing as his primary material (Taylor et al., 2006). Parnes (1977) encouraged individuals to visualize other uses for an idea or object, and "fantasize" – with a focus on specifics – how the object/idea would function in the new uses/purposes (p. 470). For example, if linking ice cream to space travel, one might question whether oxygen could be stored in a gel form. The absurd can lead to interesting perspectives. In another exercise of imagination, one might be asked to entertain an "expected development," and visualize how that development would affect the problem situation (Parnes, 1977, p. 470). What would happen if the room suddenly flooded? A component jammed? The lights went out? The proposed development is intended to bring hidden or ignored aspects of the problem to light.

Gehry questioned the *assumptions* that chain-link fencing had to be used only for fencing, and that it was “ugly.” He, in a very effective way, “problematize[d] existing assumptions and challenge[d] traditional expectations” (Eisner, 2002, p. 13). Highly creative people tend to reconsider everything. De Bono’s conception of lateral thinking supports the belief that one should “be able to challenge anything at all, not just items which are problems” (Lateral Thinking, 2013, p. 8). This includes questioning or *challenging* the “accepted ways of operating”; “the present way[s] of doing [something are] not necessarily the best” (de Bono, 2013, The Thinking Techniques section, para. 3).

An apt example is the recent rethinking of the functionality of the upright vacuum cleaner. Until the innovative direction of Dyson “Ball” design was introduced, two (or four) wheels were assumed to provide the best maneuverability possible. Perhaps at one point in product development discussion, someone at the Dyson company asked the *right* questions – the fundamental ones: Why wheels? What other solutions could provide fluid movement? Could something else offer more steering control?

More than just questioning or challenging “anything that is obviously and generally accepted as ‘goes without saying,’” at times it becomes necessary to “take an opposite view” or “try to convincingly *disprove* [emphasis added] it” (Lateral Thinking, 2013, para. 10). Again, a designer at Dyson might have begun his/her efforts with a hypothesis meant to disprove: All current vacuums on the market – despite claims to the contrary – provide clumsy, awkward, and inefficient movement.

**Empathy.** It is widely understood that “children create imaginary situations through play and art” (Kay, 1998, p. 263). What is often misunderstood, however, is that children develop “abstract thought (whether verbal or visual) [, and higher-level thinking

skills] . . . by creating imaginary situations” (p. 263). A great exercise in imagination is using empathy to step into another person’s shoes, and reflect on that person’s unique outlook. Prince (1967) explained empathy in its most commonly understood use as a kind of “role-playing” (p. 7).

Kay (1998), Parnes (1977), and Prince (1967) have suggested that the same empathic imagination can be applied to non-human things, or “purely technological or abstract problems” (Prince, 1967, p. 8). Pretending that an object has human depth requires “conscious self-deceit” (Prince, 1967, p. 8). In proposing absurd, irrelevant connections between information and human emotions, a fresh perspective on a problem can be achieved; a marked shift in thinking occurs. Kay identified this special form of empathy as “physiognomic perception”: “the ability to animate the physical environment with a perceptual metaphor” (1998, p. 275).

**Surrealism.** The period of Surrealism immediately brings to mind dream-like imagery, and the sometimes bizarre, nonsensical shock of strong juxtapositions. “Radically disparate elements” are brought together to create meaning through contrasts – and less obvious similarities (Gude, 2004, p. 194). In a piece of art, the component materials, images, and concepts share a common space; the viewer, therefore, is inclined to try to reconcile the pieces in that space into a whole. Very much related to idea of the force fit from synectics, and arousal theory, tension and interest rise until content – however subjective – is perceived. In their exciting embracing of the absurd, random, accidental, and arbitrary, surrealist methods deserve special mention. Surrealist artmaking processes relay on the creative potential of the unconscious. Three major aspects of those

processes are useful to the art educator interested in encouraging students' creative breakthroughs.

***Seeing Into.*** Where does the artist look for inspiration? He/she looks everywhere – especially in the most unlikely of places. For architect Frank Gehry, it has been “the negative volumes in a wastebasket” or “a crystal chandelier”(Taylor et al., 2006). Gehry has noted that “You can look anywhere and find inspiration” (Taylor et al., 2006). Leonardo da Vinci “look[ed] for patterns in puddles and stains,” and searched for inspirational “accidents” (Stokes, 2006, p. 151). Artist Max Ernst also “look[ed] for images in the random stimuli of blots and stains” (Gude, 2010, p. 35). Ernst called the activity ““seeing into”” (Bradley as cited in Gude, 2010, p. 35). What one *recognizes* as potential ideas for art is a reflection of the aesthetic sensibilities of the unconscious. Unconsciousness structures or organizes connective networks of ideas and “select[s] those [ideas] that satisfy [one’s] sense of beauty” (Hadamard as cited in Frederiksen, 1984, p. 385).

***Unconscious Processing.*** It can be slightly unsettling to know that the unconscious mind is always at work, especially while one sleeps (Bartel, #5 section, para. 3). However, the phenomenon, called “autonomous unconscious processing,” (Frederiksen, 1984, p. 385) actually benefits creative problem solving. “Based on the notion of getting rid of competing ideas,” “passage of time permits unconscious thinking to go on” (Frederiksen, 1984, p. 389). Ironically, “an idea being sought may appear spontaneously when one temporarily abandons the search and turns his or her attention to other matters” (p. 389). Time for what is called “incubation” should be factored into planning for art projects. Bartel (2012) reported that he presents the “challenges” for

projects long before “the actual production [begins] so the subconscious mind can be focused on it” for a longer-than-typical period of time. His art assignments overlap because “creative people generally have several projects going on simultaneously at different stages of development” (#5 section, para. 3). If given sufficient time, the unconscious and subconscious can support the goals of the conscious mind.

***Chance Procedures.*** According to Stokes (2006), “Artists have always used chance as a task constraint to introduce surprise into their work” (p. 151). While the art that is derived from such a process will likely surprise viewers, “the person meant to be surprised is the artist” (p. 151). The surrealists were very much concerned with exploring the unknown within themselves, to release the potential of the unconscious. “Surrealist artists sought to catch the unconscious mind unawares [*sic*] and capture the images of the unfettered imagination” (Gude, 2010, p. 35). Often surrealist artists “began paintings with ‘automatic writing,’ a kind of doodling designed to preclude control and promote chance” (Stokes, 2006, p. 151). As Stokes asserted, artists have always used procedures of chance to jumpstart creativity, and they will likely continue to do so. One prominent example of a contemporary artist introducing chance into his work is musician David Bowie. He collaborated with a friend to develop a computer program, The Verbasizer. After he enters from one to 25 sentences in pieces into the program, the program randomly cuts up and resplices text, generating poetic and powerful idea starters. The resulting words and phrases can quickly spur a song, or elicit visions or images that can later lead to song lyrics. In the 1997 documentary *Inspirations*, Bowie revealed how the randomizing of The Verbasizer influences his methods:

What you end up with is a kaleidoscope of meanings and topics and nouns and verbs, all sort of slamming into each other. . . . [I can then] play against it as a

basis of improvisation. . . . The choices that I now make from this form . . . I can reimburse it with an emotive quality if I want to, or take it as it writes itself. . . . It's almost like a technological dream in its own way. It creates the images from a dream state without having to go through the boredom of going to sleep all night[.] . . . And it will give me access to areas that I wouldn't be thinking about otherwise during the day, because it will prompt feelings and ideas that in the natural course of events I probably would have skirted around or just not been involved in"

Bowie decides when to take the pieces of random text verbatim, when to use them for pure inspiration, and when to "play against" them.

Surrealist games can be excellent ideation exercises. While not a true surrealist game, the word game Mad Libs has the surrealist spirit. For the Mad Libs game, one player prompts another for a list of words – nouns, adjectives, and verbs. The list is made first, and then the words are substituted for corresponding blanks in a story. Interesting chance happenings happen when the words are inserted. It might be fun for the teacher to write his/her own fill-in-the-blank stories. Or the students could. Maybe the students could first cut select words out of a page of magazine/newspaper text. After the page with holes is taped or adhered to a blank piece of computer paper, the blank spaces could be numbered. On a separate piece of paper, they could write the same numbers and the parts of speech. After students paired up, the pages of text with missing words and the word lists could be exchanged.

## CHAPTER VI

## CONCLUSION

At the end of much self-searching and research, I have arrived at the beginning of a new search: the search for masterful teaching practices. I see myself applying various aspects of this complex theory for years to come – perhaps my entire teaching career. But, there is pleasure in the search. The main goal of this thesis was to establish an informed trajectory. I have a range of teaching experience, Kindergarten through Pre-college, but much of that experience was based on the current focus of many art educators: presented, or skill-based lessons. Exciting developments are sure to happen as I encourage students to find their own problems, to I find those rich questions that can only come from them. Every student is unique because of the life experiences that have helped formed them. Their memories have literally structured their brains, and contributed to their aesthetic preferences. The primary task for me, as a teacher, is to develop that *attitude* of creativity within my students. I will do everything in my power to teach them to maintain an openness of mind, to question assumptions, explore multiple perspectives, and enjoy the conceptual play of ideas. Students can learn to approach the uncertainty of ill-structured problems with confidence. It begins with them realizing that they have the power to successfully explore their own new ideas. The euphoria arising from a healthy authorial spirit is addicting. Students have valuable ideas. They must come to trust their own ideas as the source of their most meaningful artistic revelations.

I look forward to getting my own art room, to designing my laboratory of learning. As Bartel (2012) has recommended, I will incorporate “idea generation activities” into the daily and weekly art class routine (2012, #10 section, para. 6). Gude (2010) has regularly used a “Surrealist play day” to “extend students’ capacities for focused and playful engagement” (p. 35). No *idea* is precious; it can always be dismantled, reconstructed, flipped, reversed, turned upside down, put under water, launched into orbit, cut in half, or thrown into a tree. The entertaining of absurd or outlandish ideas can lead to breakthroughs. Remember that creativity can be defined as “the ability to experiment toward productive acts” (Edwards as cited in Simons & Skoreyko, 2011). Premature judgment is not helpful for experimentation, and is, therefore, destructive to creative imagination.

As I run into my art own room and immediately start *designing* the experiences I desire my students to have, I need to remember that, for many students, the transition from more prescribed products to evolving intentions, problem-solving, and self-regulation will come with resistance. After having been assigned more problem-based artmaking activities (mainly in college) and achieving successful outcomes, I see the value of those types of projects for creative growth. However, many of the fifth graders from the Chimera unit were skeptical or disapproving of the added mental effort required by the layers of problem-solving in the unit. I must realize that while not everyone will enjoy solving problems as much as I do, everyone can intellectually, emotionally, and socially benefit from solving more problems. Dewey would likely agree. It may be, as I have already noted, only a matter of time – with consistently high expectations in the art room – before more students embrace creative problem solving as a major part of their



assignments. Bartel (2012) wrote that “students of nearly every age can learn to give themselves limits, but I have to cultivate the classroom culture where these expectations are expected” (#7 section, para. 3). Also recall from Bartel (2012) the foremost goal of a creativity curriculum is “to actively move students in the direction of self-planning for creative thinking” (#7 section, para. 4).

More planning on the part of the teacher is required if he/she wants to create visual arts problems with rules that are not reactive, problems that students can respect. Also, it is important to remember that students’ *first* attempts at guiding their own independent research, problem finding, and problem solving may not display a high level of originality. The results of those first efforts are likely to be” interesting [variations on] common topics of interest” (Kay, 1994, Step VI section, para. 6). But this may be a “necessary step (for some students) toward the development of original thought” (Kay, 1994, Education Implications section, para. 1). The art educator should not expect an immediate explosion of creative solutions and enthusiasm to their first problem-solving-oriented lessons.

We have discussed many professionals from a variety of disciplines who use self-imposed parameters to stimulate novel thinking, and preclude the reuse of successful or “safe” solutions. These are real examples of people who have found original and influential ideas by creating problems for themselves to work through. Possibly one of the most vital points for the art teacher to remember is that constraints do not, in actuality limit creativity. Return, if you will, to the bottleneck concept. The bottleneck compresses or focuses thinking; infinite possibility goes into the bottleneck, and virtually infinite possibility emerges on the other side. Students need to be aware of the fact that

parameters do not reduce possibility – they merely make the possibilities a bit harder to see. A clever student will understand that the number of possibilities remains constant throughout; it is the number of original ideas that changes for the better.

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**APPENDIX A**

**CHIMERA UNIT: IDEATION WORKSHEETS**



ROLL  
THE DIE!

names: \_\_\_\_\_

Group

Class Code: \_\_\_\_\_

## OUR MYTHOLOGICAL CREATURE:

A		Has:
B		Has:
C		Has:
D		Has:
E		Has:
F		Has:
G		Has:
H		Has:
I		Has:
J		Has a special power:
K		Has a special power:
L		Has a special power:
M		Its purpose is:
N		Its main skill is:
O		Another skill it has is:
P		Uses transportation by:
Q		Has a prized possession:
R		Has another prized possession:
S		Lives in:
T		Lives in:
U		Will grant something if pleased:
V		Texture Technique:



**OUR MYTHOLOGICAL CREATURE...****A. Has:**

1. Long hair
2. More than two eyes
3. More than two arms
4. 1 arm
5. Strong muscles
6. Huge feet

**B. Has:**

1. Insect wings
2. Feathered wings
3. Small scales
4. Wings with a thin membrane of skin – like a bat
5. Colorful fur
6. Large scales

**C. Has:**

1. Tiny hands
2. Large brain
3. Cat eyes
4. Long giraffe legs
5. More than two legs
6. Three heads

**D. Has:**

1. Goat legs
2. Green tail
3. A hawk's talons
4. A mermaid/merman tail
5. One eye
6. An elephant trunk

**E. Has:**

1. Butterfly wings
2. Kangaroo legs
3. Caterpillar legs
4. Toucan or parrot beak
5. Elephant tusks
6. Ostrich neck

**F. Has:**

1. Frog legs
2. Antennae
3. Leopard/jaguar spots
4. Tiger/zebra stripes
5. Horns/antlers (impala, bighorn sheep, yak, wildebeest, water buffalo, gazelle, African Buffalo)
6. Stinger of a scorpion

**G. Has:**

1. Flamingo/ostrich legs
2. Snake skin
3. Narwhal tusk
4. Goat legs
5. Duck feet
6. Striped lemur's tail

**H. Has:**

1. Anteater snout/tongue
2. Armadillo plates
3. Skin covered with crystals
4. A shell in which it can hide if threatened
5. Hair on its head(s) that is *alive* (example: Medusa)  
Instead of snakes, yours creature might have a head covered with talking flowers)
6. Dragonfly/fly eyes

**I. Has:**

1. A lion's mane
2. A rabbit's ears
3. A turtle's long neck
4. A sheep's wool coat
5. A seahorse's tail
6. An octopus' tentacles

**J. Has a special power:**

1. Talking to animals
2. Flying
3. Quickness
4. Strong swimming
5. Extraordinary intelligence
6. Caring heart

**K. Has a special power:**

1. Breathing fire/ice
2. Its tears give life, or make things grow
3. Powerful eyes that can see for miles
4. Shapeshifting – changing size/form
5. Covered with long spines for protection, like a porcupine or sea urchin
6. Has control of the earth (dirt, rocks, mud)

**L. Has a special power:**

1. Breathing through gills
2. With a touch, can cover anything with flowers
3. Can see into the future
4. Has control of the wind
5. Can travel to the stars
6. Can camouflage itself like a chameleon

**M. Its purpose is:**

1. To free the enslaved
2. To grant wishes
3. To protect the forests
4. To destroy evil
5. To bring laughter and happiness
6. To make rain, and control weather changes

**N. Its main skill is:**

1. Acrobatics
2. Healing
3. Creating beautiful things
4. Exploring
5. Being heroic
6. Defending others

**O. Another skill it has is:**

1. Burrowing underground
2. Singing – an enchanting voice
3. Sailing
4. Building
5. Archery
6. Alchemy – turning things to gold

**P. Uses transportation by:**

1. Horse
2. Tiger
3. Whale
4. Flying on an eagles back
5. Elephant
6. A floating suit of armor

**Q. Has a prized possession:**

1. A magical animal
2. A ruby belt
3. A golden harp
4. A powerful horn
5. A jeweled sash
6. A mask

**R. Has another prized possession:**

1. A unique helmet
2. A sparkling cloak
3. A power amulet (necklace)
4. A mechanical monkey
5. Scrolls of knowledge
6. Shield of invincibility

**S. Lives in:**

1. A castle
2. A tree
3. A beehive
4. A cave
5. A flower
6. A garden

**T. Lives in:**

1. The hot sands of a desert
2. A strange forest
3. The ocean depths
4. On a steep cliff face
5. Inside the Sun (super hot)
6. Antarctica (so cold)

**U. Will grant something if pleased:**

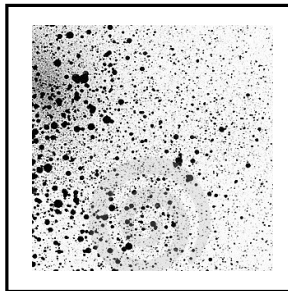
1. Riches
2. Good crops
3. Health
4. Love
5. 3 wishes
6. Eternal youth

**V. Texture Technique**

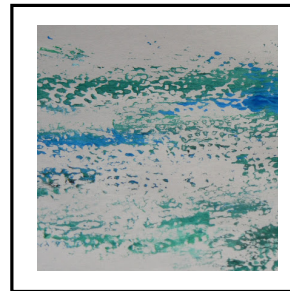
1,2  
Scratch (sgraffito)



3,4  
Splatter



5,6  
Paper towel



**APPENDIX B**

**CHIMERA UNIT: DETAILED TEACHING PROCEDURE**

## Week 1: WORKING WITH THE DIE

I first presented a sample sketch of the mythical creature I created using the process intended for teaching the fifth graders. I asked them to place their full trust in the process. Acknowledging that some of the process to come might seem “random,” I asked the students if they could think of any way it *might* be good for art to be more random and less controlled. Students then jumped directly into picking a partner(s) and rolling a die after a very brief demonstration. Their number results were recorded in pen on their characteristic charts (one sheet per group). The students did not have the “answer key packet” at this point. We regrouped on the floor where I explained the next phase of ideation. Every number corresponded with a potential characteristic, ability, environment, or special possession for their creature (see Appendix A for worksheets). Students were to write their selections in pen on the charts. At this point, no changes could be made to the list of items. As the students lined up to leave, the exiting question to help preview the upcoming content of the unit was “Can anyone tell me what a demigod is?” I collected library books for reference material after school one day that week.

## Week 2: CONNECTIONS TO THE GREEKS

The myth of *the* Chimera and other Greek Chimera-like creatures having disparate parts were introduced in game show style. I asked, among other things, “Who knows what a centaur is?” or “Does anyone know how the Hydra was defeated?” The similarities between our creative process and the characteristics of Greek mythological characteristics were discussed. Also, the students offered their own definitions of *myth* (any conceivably negative or offensive associations with the delicate subject of religion were identified and resolved). *Myth* was differentiated from terms such as urban legend, folktale, fairytale, legend, tall tale, fable, and allegory. Questioning followed by clarification continued: “Were these mythological creatures strange in appearance for no other reason than to be strange? In fact, they had a purpose, allies, enemies, and a native habitat. These are things you can think about as you mold your creature and its story with your partner(s).” Students were then allowed to pick and choose, and/or alter their list of ingredients they collected with help of a die. I presented visuals to the students for ideas on how one might create a creature with, for example, more than one head, or more than two legs (see Figure 10). The library cart of books filled with visual reference material was made available to the class. Blank copy paper (8.5 X 11”) was also distributed for thumbnail sketching. After agreeing on a finalized version of their characteristics list, each pair (or group) of students then started sketching different ways the “parts” could be combined into a cohesive whole. At least three thumbnail sketches were required. The look of, and purpose of, thumbnail sketches was explained. I showed the students the thumbnails I drew for my sample painting. I thought it would enhance students’ understanding of sketching to make connections to the common practices of many professional artists. It really is a myth that artists always run with their very first idea – many ideas are generated and the best one is chosen. It is called *artwork* for a reason. Much work is done and most of it is never even seen by others. Just think about all the rejected sketches, rough drafts, lyrics, notes, mathematical solutions, and scientific

theories throughout human history. Students were encouraged to sketch further their favorite of their thumbnails by drawing details and enlargements (see Figure 2). For homework, students were asked to procure images they needed that they could not find in the reference books.



*Figure 10.* Chimera Unit Teaching Visuals. Students benefited from these simple visual examples of how to reconceive or distort the human body.

### Week 3: BUILDING AN ACTION PLAN

The students presented their thumbnail sketches to receive an elongate piece of paper approximately 6 X 18” for the next step of the process. Students were paired or grouped so that one person in each pair or group can be traced onto the large butcher/craft paper by the other(s). This was the time to plan for the placement of the student onto the paper. My thinking was that the better their plan was, the more confidently they could attack the challenges of larger scale. Students planned for the following “problems”:

Where will the individual being traced need to position him/herself to allow room above or below for the other elements of their character? Will additional paper need to be attached to the sides of the initial piece to accommodate wings or increased width? Perhaps they need only a partial outline of the tracee, or need to move a body part to have it traced multiple times. Perhaps their design called for an arm to overlap the torso or abdomen. In that instance, the outline of the body with overlapping arm/hand is done first and then the arm/hand must be returned to the original location and position to be traced.



To assist with this planning, I provided the students with posable figure stencils. Each pair/group could then add details to the outlines (inside/outside). At this point, things started to come together as a singular vision.

#### Week 4: COOPERATIVE TRACING

Students showed me their action-plan stencil sketch. Once I approved of their level of planning, they then chose a color and length of butcher paper. I had previously labeled with pencil the rolled pieces of paper with their lengths. In order for the students to get the tightest and most believable tracings, I instructed them to angle their tracing implement in (a dull pencil worked well) as they worked their way around, and slightly underneath, the tracee's body. This helped eliminate most unintentional distortion, i.e., the well-known "balloon fingers." Before tracing began, it was necessary to establish personal physical boundaries, or "no-trace zones." Stopping mid-inner thigh to avoid the groin area, and just before and after the pelvic region (lateral aspect) are suggested no-trace zones. Off course, for females the chest could be an issue. All of this will have to be adjusted for different age groups. Where it becomes particularly vital is when some of the pairs/groups are of mixed gender, or if students with special needs require supervision. I also started a special shopping list for those items the students requested that were not currently available.

#### Weeks 5 - 12: THE VISION COMES TO LIFE

The lines that were traced in pencil were drawn over with permanent marker (if that had not already been done). It was explained to students that if the marker lines get covered with the tempera/acrylic paint, they can – at the artists' discretion – be brought back entirely or selectively. In preparation for painting, adequate spaces within the classroom were allocated for the teams. Doorways, walls, tables merged with other tables, and the floor were options that served the purpose well. I predicted that a range of large brush sizes (4", 3", and 2") would boost the students' self-assurance as they made their first painted marks on the butcher paper, and speed up the process of blocking out large areas of color over the whole paper. After the paintings were beyond the very early stages of development, marker lines could then be restated, and the many forms of embellishment incorporated. Faux jewels, feathers, glitter paint, graphic colored duct tape, and sequins were some possible embellishing materials. A demonstration for painting techniques covered three versatile methods: sgraffito, splatter, and paper towel dappling. Students were asked to include one of the techniques in their pair's/group's piece. I created a piece of my own to move in synch with the pace of the classes to clarify goals and expectations for the process and final product (see Figure 11). I hoped that the steady progress on my piece would be something the students could eagerly anticipate seeing each day they came in for art. Seeing my process helped the students understand that art can be difficult and time-consuming even for adults.



*Figure 11.* Teaching Sample: Chimera Painting and Narrative. Writing can extend or expand an art activity, deepening the students' investment of idiosyncratic content.

## Weeks 10 - 12: ELABORATING THROUGH WRITING AND REFLECTION

While the finishing steps are in progress, every student is asked to independently write the description and story of his/her creature. Group members can later compare their writing, and perhaps work to merge the different versions into one that best represents the pair/group.

Creative exploration seems to naturally come in waves. While the ideation built up to the visualization of highly original characters, the beginnings of a new wave of idiosyncratic meaning were forming in the minds of the student artists. When I work, I have noticed that inspiration flows both ways between words and imagery. A word or collection of words might lead my mind to visualize. Materializing that visualization usually provokes new narrative or poetic words. Extending and expanding the artistic energy and personal investment of the students is a very useful way to sustain the learning momentum. This is an activity that can function to inform post-assessment data. So much learning in visual art is done individually, in the secluded cave of the mind. This learning – other than the incredibly accessible glimpses outside-others get from analyzing the visual artifact – is for the most part not easily visible. Much of the learning in the art room happens so naturally, quickly, and independently that, at times, the art teacher – and others – may not fully see the extent of the rich thinking that is occurring. But the learning *is* there, in all its cross-disciplinary, multi-faceted significance. It is important that students be given chances to verbalize their difficult-to-verbalize inner-awakenings. Discursive modes of communication (language written and spoken) is linked in a mutually beneficial relationship with the non-discursive (visual art being a prime example) (Zurmuehlen, 1990, p. 12). It is a true opportunity when the students reveal some of this hidden learning during discussion or critiques. Despite the aspects of a person that are not easily perceived in his/her art, many clues can be gathered that suggest personality, perspective, important life experiences, and more.

A short post-assessment questionnaire was handed out to the students. In sharing my sample written description (see Figure 11), I hoped to motivate students to make their creature narratives just as imaginative as the visual representations. Most of the students took the narratives very seriously; their words enriched their visual work by providing more details and a different perspective. Cooperating with the home room teachers, I required students to type their narrative/descriptive responses. Another level of expressive communication was achieved through the *formatting* of the text itself (font, color, effects, etc.). To bring closure to the unit, a slideshow of student work from all fifth grade classes was shown to each of the fifth grade classes.

**APPENDIX C**

**CHIMERA UNIT: MORE REFLECTION**

I struggled with how much I wanted to tell the students about the ideation process at the start of the lesson, before the dice were rolled. If the students knew the true purpose of the die before they rolled, they might have tried to influence their number “choices” in strange ways. It is also important that the group stay synchronized in regard to pace during these first few checkpoints. Again, if a pair/group of students were to glimpse another group working on steps that were further along in the process, that pair/group would surely change their behavior – and therefore corrupt some of their ideation scaffolding. Attempting to “cheat” during this early phase will only hurt the quality of the idea combinations the students would have likely found had they let *chance* mix things up.

I chose to cover beings from Greek mythology because of the high probability of the students possessing at least a hint of prior knowledge on which to build. These Greek creatures also very clearly illustrate the success that can be attained by fusing distinguishable parts from various familiar fauna to create an entirely different and awe-inspiring concept. I do recognize the Western ethnocentrism, and I definitely wonder what effects might be achieved by working with non-Western cultures and their mythologies.

It might have helped to create limits for the *size* of the thumbnails – perhaps just simple boxes printed on the copy paper would suffice. Some students worked too large at this phase; they didn’t get to explore as many alternatives as I hoped they would have.

Students were tempted to bypass thumbnail sketching and move directly to stencil work. While the stencils are attractive and entertaining, they carry with them certain implicit limitations: mainly, the *completeness* of their form. Student must see *past* the stencil, they must see the stencil as a means to achieve their original intent. If a group of students had the intent of creating a creature which only borrowed the head and torso forms from the human form, these students should not feel pressured to use the *entire* stencil simply because it is whole.

Also, for this age group, the option the students were given to add pieces of paper onto their stencil sketches (for wings, accessories, etc) seemed to overwhelm them. Some students added cut paper extensions to their stencil sketches, but none ended up attaching large pieces of paper to the sides of their large butcher paper.

I should have emphasized that the drawing they did on the butcher paper would most likely be covered with paint/embellishments later. The priority at this phase of the process is the locating of the large shapes, mainly the major body parts and extremities. Students wanted to draw every tiny detail right away.

Some of the students still seemed hesitant with applying the first layer of paint to their butcher paper. Perhaps only providing the biggest brushes (3-4”) for the first day of painting, and making it a class goal for everyone to cover their entire sheet of paper with one layer of paint would have given the students that vital first push. Also, I should have

discussed the ebb-and-flow-nature of painting. A balance of order and chaos, cleanliness and disarray, in painting, elements (example: lines) are created and buried, only to be excavated later. It is a matter of push and pull that requires the painter to relinquish some degree of control at times.

On a practical note, the Elmer's brand blue Gel School Glue did not have the holding power necessary for all of the collage embellishments students wished to add to their creations. Many of the faux jewels and sequins are falling off of the sheets of butcher paper. Weldbond, Tacky, or hot glue would have been much better choices.

It occurred to me just before the students were reaching the end of their work time on these Chimera paintings that it might have been a good idea to have had the students jot down notes (in a notebook?) for ideas surrounding their creatures as they came up during the making. This would make the forming of a narrative come about more naturally.

**APPENDIX D**

**CHIMERA UNIT: ASSESSMENT RUBRIC**

## CHIMERA RUBRIC

Achievement Level	Beginning	Developing	Accomplished	Exemplary
Numerical Value	1	2	3	4
<b>CRITERIA:</b> 1. <b>Fluency of Ideas Experimentation</b>	Resistant to ideation process. Not open the possibilities in his/her characteristic list that do not fit his/her preconceived creature concept. No alternatives are considered. Painting is very tight with very little texture.	Follows the ideation process introduced in the unit. Tries to include <i>some</i> of the items from his/her group's characteristic list. Explores <i>some</i> alternatives for his/her creature design. Uses at least one painting technique.	Includes <i>many</i> of the items from his/her group's characteristic list. More than the required three thumbnail sketches and one stencil sketch are used to investigate more alternatives. Experiments with more than one painting technique.	Includes <i>almost all</i> of items from his/her group's characteristic list. Further brainstorming, thumbnail sketching, and stencil sketching is done beyond what is assigned. Learns the three painting techniques, and attempts layering.
2. <b>Collaboration Cooperation</b>	Refuses to work with others. Prefers to work independently. Dismisses ideas from other group members.	Works through some disagreements while respecting most of the members of the group. Actively contributes to group efforts during every class. A leader emerges to keep the peace.	<i>See Developing.</i> Power and decision-making are spread equally among the members. Democratic consensus is used when possible. <i>Every</i> idea is respected and heard.	<i>See Accomplished.</i> Works toward group's goals in- and outside of class. Schedules meeting times during lunch, before or after school, or at a group member's home.
3. <b>Persistence Effort Problem Solving</b>	Piece is clearly incomplete. Class time was not used productively.	Piece is resolved, but paint application could be improved. Drawing is clearly stated. <i>Some</i> embellishments are used in a <i>few</i> areas. Background is not developed.	Piece is developed with many areas of thick, bright paint, and strong <i>form</i> . Embellishments enhance the entire creature and the background is at least sketched / painted.	<i>See Accomplished.</i> Multiple heads, arms, etc. are very believable. Shading is attempted. Background is fully developed to support the creature and its story.
4. <b>Planning</b>	Wants to forgo the planning process (preparation sketching).	Fulfills the minimum sketching requirements at each phase of work. Planning is vague.	Builds a full plan for his/her creature with <i>some</i> sketching beyond what is required. Every group member knows that for which he/she is responsible.	A clear plan is refined with project goals, <i>daily</i> goals, and extra sketching. Additional visual references are acquired outside of class as needed.
5. <b>Ownership Elaboration</b>	Very little of the artist's personality can be seen in the painting. Creature is a "remake" of one that already exists. Narrative is incomplete.	Infuses his/her piece with <i>some</i> personal touches. Narrative is very basic / informational.	The piece is rich with visual detail. Narrative is accomplished with some style (good descriptive language).	The piece – and its written narrative – is rich with detail. Narrative takes on a life of its own past the painting.

Total: 20 Points