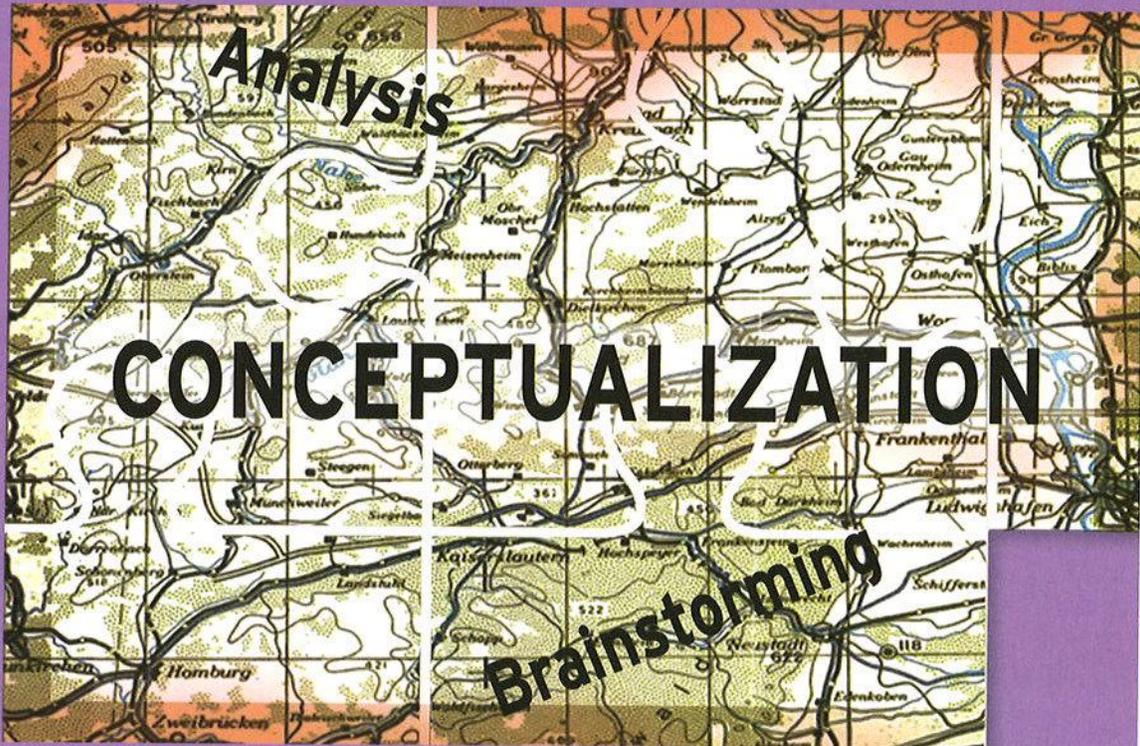


# Stage 3



## OBJECTIVE

Once you identify the design problem, you are ready to examine methods for conceptualizing your ideas to come up with a solution. You examine the nature of a design concept and how using intuition and metaphor helps you create a coherent presentation. This requires you to develop a thought structure that uses known elemental images to explain the unknown and unseen. Finally, the chapter establishes the need for you to present your concept to the various audiences involved in a clear and organized manner.

## KEY CONCEPTS

- A design concept is an abstract vision that needs to become tangible.
- Brainstorming techniques allow you to examine a concept and fully explore what it contains. Brainstorming encourages you to visualize and intuit a concept's elements.
- The laws of *gestalt* perception can be applied to the examination of a design concept.
- Analogies, metaphors, similes, and intuitive thinking are helpful tools to visualize, describe, and explain nonexistent objects.
- Designers must be able to relate to designs, their end users, and the intended interaction, which allows them to be flexible when responding to problems and questions.
- Clients, fabricators, and fellow designers have different needs regarding concepts for new designs.

## BRINGING THE IDEA INTO THE WORLD

The thesis from the previous stage is a good beginning, but it only outlines a direction. It does not really show us the object, nor does it convey much of its interaction with the world. Conceptualizing an idea will show you how all its pieces fit together and let you visualize the final result.

This stage answers the following questions:

- How can you describe and explain designs that do not actually exist and may never have existed?
- How can you explain this idea further, so that your clients, fellow designers, and production team can understand and relate to what you are thinking?
- How can you understand your idea to the point where you know as clearly as possible what it is and how it behaves?
- How do you know that your concept is as good as it can possibly be? Is there anything more you can do? You must explore ways of fleshing out your concept so it begins to have a life of its own, a life that you can observe and relate to, understand, and explain.

## CREATING SUSTAINABLE CONCEPTS

In creating a concept, you must keep sustainability on the front burner from the word “go.” As you begin to assemble the images and information that define your concept, you will need to consider the nature and behavior of the upcoming design in general terms. This examination should allow you to identify areas where sustainable practices can have an effect, but more importantly, you can, at this stage, make sustainability an *inherent* constraint. That is to say, consider which of the elements of your concept can be defined so that the minimizing of their environmental impact is an integral part of the design’s identity. This way the designed product, whether large or small, mass-produced or individually crafted, becomes as environmentally friendly as possible, as its underlying concept addresses the issues of sustainability.

This is actually a fairly simple exercise. Taking each of the most basic elements of a design, simply ponder how this element could have less impact on the environment, be less demanding



**Figure 3.1** During the conceptualization phase we explore ways of fleshing out a concept so it has a life of its own that can be observed, related to, understood, and explained.

on resources, or both. Consider the different parts and materials, energy use, and ways in which the design may afford wasteful behavior by not allowing repair, reuse, or recycling.

That *form* and *function* inherently should relate is by now an old truism, but perhaps in your design this relationship can improve under sustainable practices. How could the form of your design be conceptualized to be directly contributing to its eco-friendliness? This may have immediate implications in architecture, but less obvious implications elsewhere. However, creating a form of any kind from any material requires energy, and a small alteration in the design's form may result in less-complicated construction therefore requiring less energy for production and perhaps a greater economy of materials. Forming the object may also be done by other methods than are usual, and these methods may be more labor intensive in terms of human labor. The *fabrication* may therefore become a large conceptual component, and this may impact the budget, so keep your client in the loop. Bringing back an old pre-industrial method of construction may, for example, result in less energy use and less pollution, but much higher labor costs. Fabrication may also include processes that require chemicals or are highly wasteful of materials—nothing should be exempt from questioning. This all may then need to be examined and negotiated with your client in order to find where the acceptable level of change or innovation on your part lies. Until the reality of the need for sustainability is obvious in our culture, you may need to instruct your client (perhaps with a degree of diplomacy) on why all your recommendations are important.

Is there something in the *functionality* of your design that will allow it to be environmentally friendlier, even as it operates? Can the functioning actually contribute to a minimizing of the environmental footprint? Take the concept of functionality itself to its most basic state: Not only do you ask what this design *does*, but what do its materials actually *do* in their environment? What are the large-scale and small-scale effects of its doing whatever it does to the environment, large and small? Designing an engine to function on less fuel is a no-brainer, but what about energy use in general for appliances and machines? How about warming and cooling in the choice of fabrics for clothes? Do the cleaning and care require energy, chemicals, or wasteful use of other materials? Can an interior of a building perhaps function as a system by its *material choices* to contribute to the cooling or insulation of the building?

*Materials* will be an enormous part of the environmentally conscious designer's concerns. How are they produced? Where are they shipped from? How do they behave in use? At the

**Figure 3.2** Creative work is a puzzle. Each piece can—and should—be scrutinized for its environmental impact. Here, reclaimed and recycled lumber is being examined before being chosen for use in furniture-making.



top of the list are questions of whether the materials are recycled, recyclable, or reusable. If not, what is the effect of their disposal? Note that the materials themselves have a life cycle that is, in some respects, independent of the designed product, and if they are fully recyclable, then you must have the mind-set that your designed product is in effect merely “borrowing” these materials for the duration of its lifetime. If you consider the materials as components, this kind of thinking will come to you very easily. The components form a totality that is larger than their sum (more about this in a moment) but each component contributes to the designed object’s identity. Finally, *colors* are notoriously unfriendly to the environment because of the number of toxic chemicals and heavy metals that have been used to create the bright, vibrant hues we have become accustomed to in the past 150 years. As you consider the color scheme for your designs, consider how these colors may be manufactured and whether the color scheme that you have in mind is (1) possible in an environmentally friendly manufacturing process and (2) absolutely necessary for the identity of your design. Somewhere between (1) and (2), you must reach a compromise with yourself and your clients.

By observing these possibilities and including them in the design at the initial moment of conceptualizing, the design is *inherently* sustainable right from the beginning. Environmental friendliness is part of its nature, part of its totality.

A fascinating example is “Wendy,” a “temporary urban landscape” designed in 2012 for the outdoor courtyard of the Museum of Modern Art—MoMA PS1—in Long Island City, New York. “Wendy” was an experiment testing how the boundaries of architecture can expand to create ecological and social effect. It is a reusable structure composed of scaffold and nylon fabric treated with a nanoparticle spray that neutralizes airborne pollutants. The structure was expected to clean the air to an equivalent of taking 260 cars off the road for one year.

The designers at HWKN used shade, wind, rain, music, and visual identity to expand the structure’s physical limit, creating an *environment*, where blasts of cool air, music, water cannons, and mists create “social zones” in the museum’s courtyard.

## GESTALT PERCEPTION

Your idea is an abstraction, a mental image created by the elements described in your thesis. You have described this vision by referring to the elements of the design, to the end user, and to the needs and benefits driving the idea. The idea itself may be grounded in a practical reality or it may be driven by a fantasy. Either way, it exists in your mind.

There are four tasks that require you to conceptualize information and to project creatively onto your vision.

- You must fill in as many gaps as you can.
- You must ground your concept in a systemic, logical reality (which may actually be different from your everyday reality).
- You must be able to present your concept so others involved in the project understand it.
- You must be familiar with the inner workings of your ideas so you can change, rework, and rearrange their details without altering the core of the concept.



**Figure 3.3** “Wendy”—the winning design from MoMA PS1’s Young Architects Program in 2012—pushes at the boundaries of architectural design. It contributes to lessening the city’s ecological footprint, by collecting NO<sub>2</sub> from the air by virtue of its skin. Its net effect was equivalent to taking 260 cars off of the road. It was designed by HWKN in New York City.

An essential key to productive conceptualizing lies in our innate abilities to project mental images into gaps left by partial information. By brainstorming with holistic methods of thinking and analysis, we can create a wholly formed concept from the parts we have assembled.

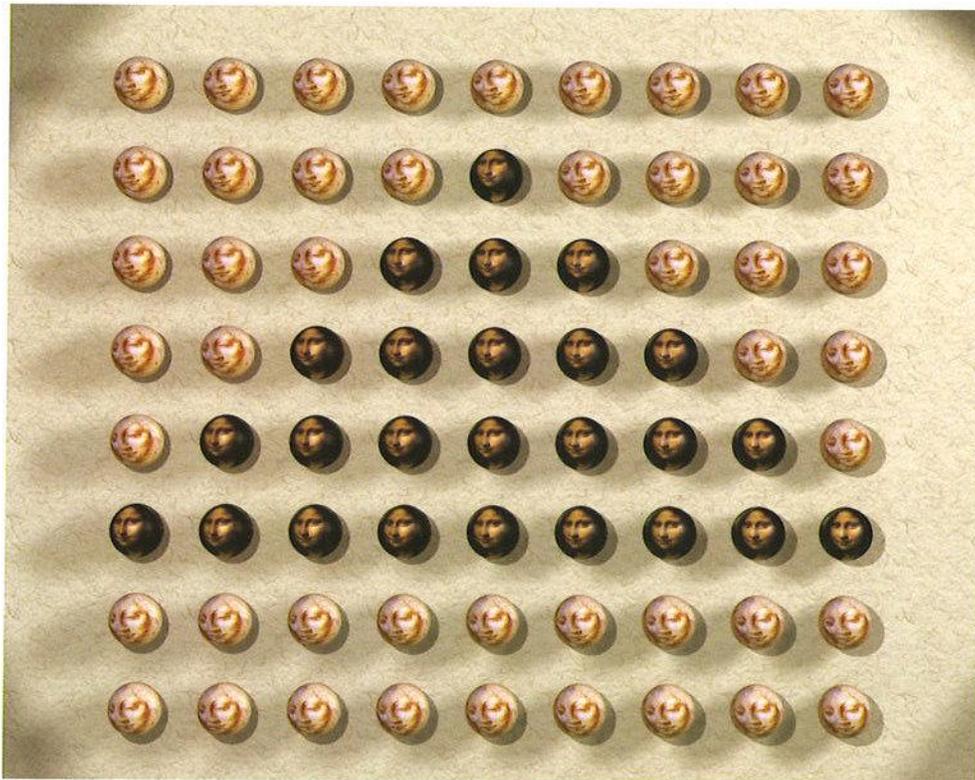
“Gestalt” is a German word meaning *shape, pattern, or form*. It has taken on the additional meaning of *whole or totality* regarding theories of perception and cognition. German psychologists Max Wertheimer, Kurt Koffka, and Wolfgang Köhler established a school of thought that argued humans have inborn abilities to organize perceptual information and experiences. This is based on the need for all humans to make sense of the world around them. The gestalt school generated a belief that the “whole is greater than the sum of its parts,” which established the notion that each of us assembles sensory experiences by perceiving them in their entirety rather than as disjointed parts.

The gestalt school formulated the Law of Prägnanz (literally meaning *pregnancy*, implying that an unfinished object is pregnant with information), which has *four* subsets of laws. The Law of Prägnanz states that of all possible perceptual experiences to which a particular stimulus can give rise, the one most closely fitting to the concept of a good gestalt (a good totality) will most likely be perceived. Because we have an innate need to make sense of everything we encounter, we will tend to see incomplete objects as complete and even as familiar.

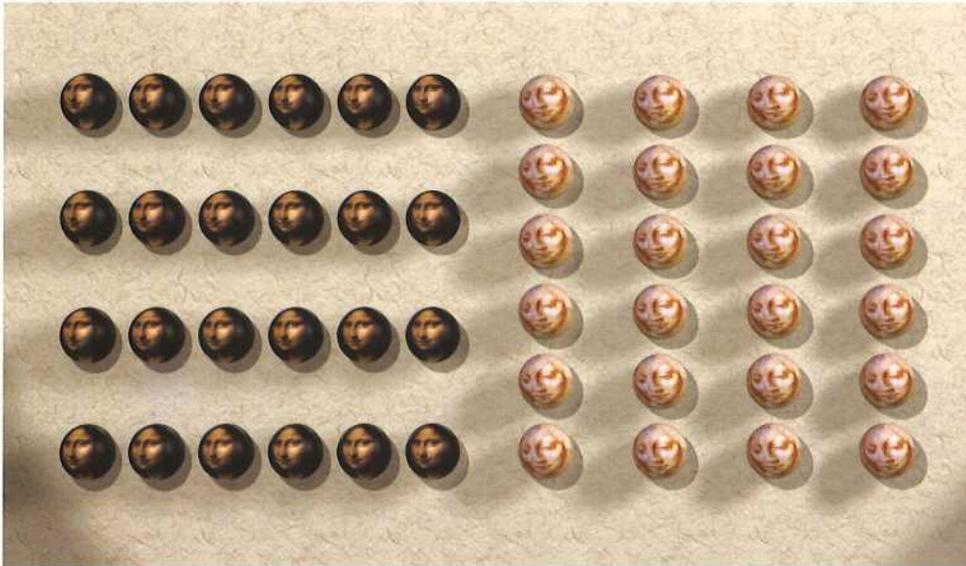
The Law of Prägnanz implies that if a perceptual field is disorganized when an organism first experiences it, the organism imposes order on the field in a predictable way. This predictable way is in the direction of a good gestalt, a psychological task that does not necessarily involve a change in the physical environment but one that represents a change in how an organism sees its physical environment. A good gestalt has such properties as *regularity, simplicity, and stability*. There are five additional laws related to the Law of Prägnanz, which are as follows:

1. *Similarity*: We tend to group similar items together.

**Figure 3.4** Similarity: Similar items are perceived as being grouped together. Here, a triangle appears within a square by virtue of the similarities of two sets of marbles. (In actual fact there is, however, neither a square nor a triangle present, only implied.)

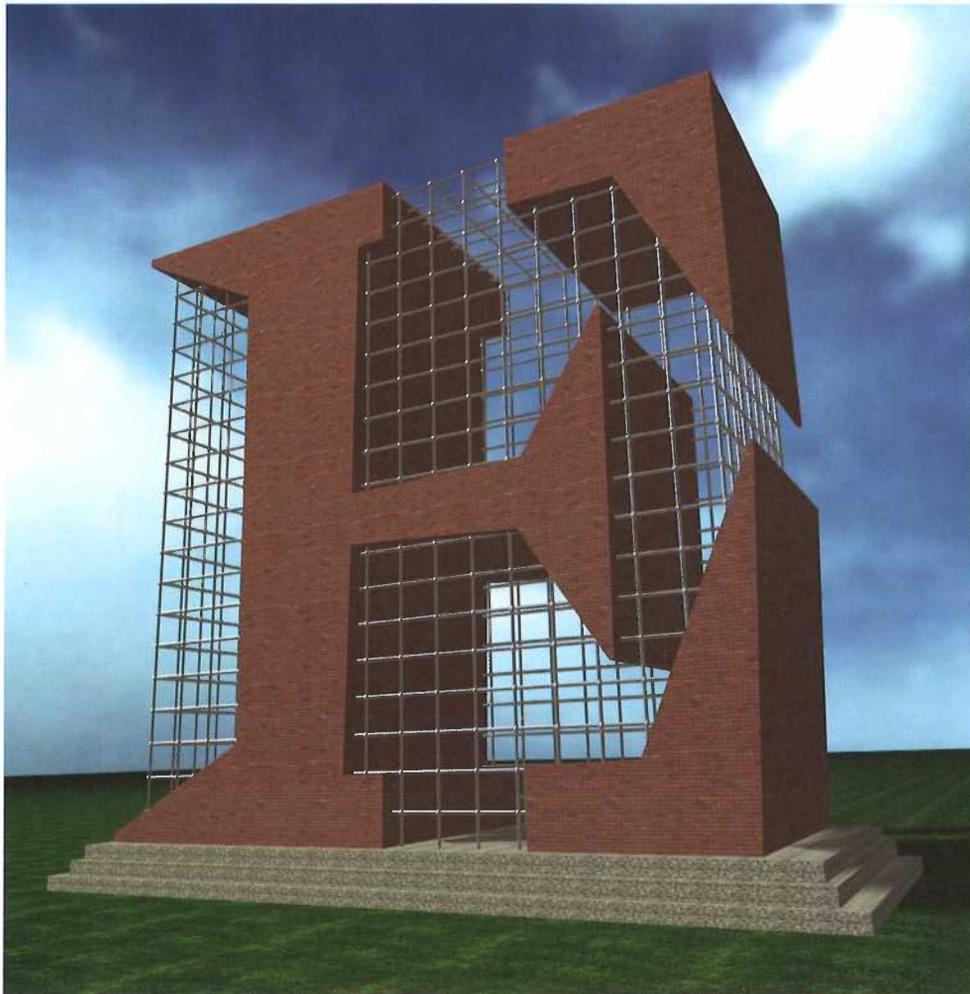


2. *Proximity*: We tend to group items according to the nearness of their respective parts.



**Figure 3.5** Proximity: The "lines" appear as a result of our tendency to interpret things close to each other as belonging together, thus creating a whole of some kind.

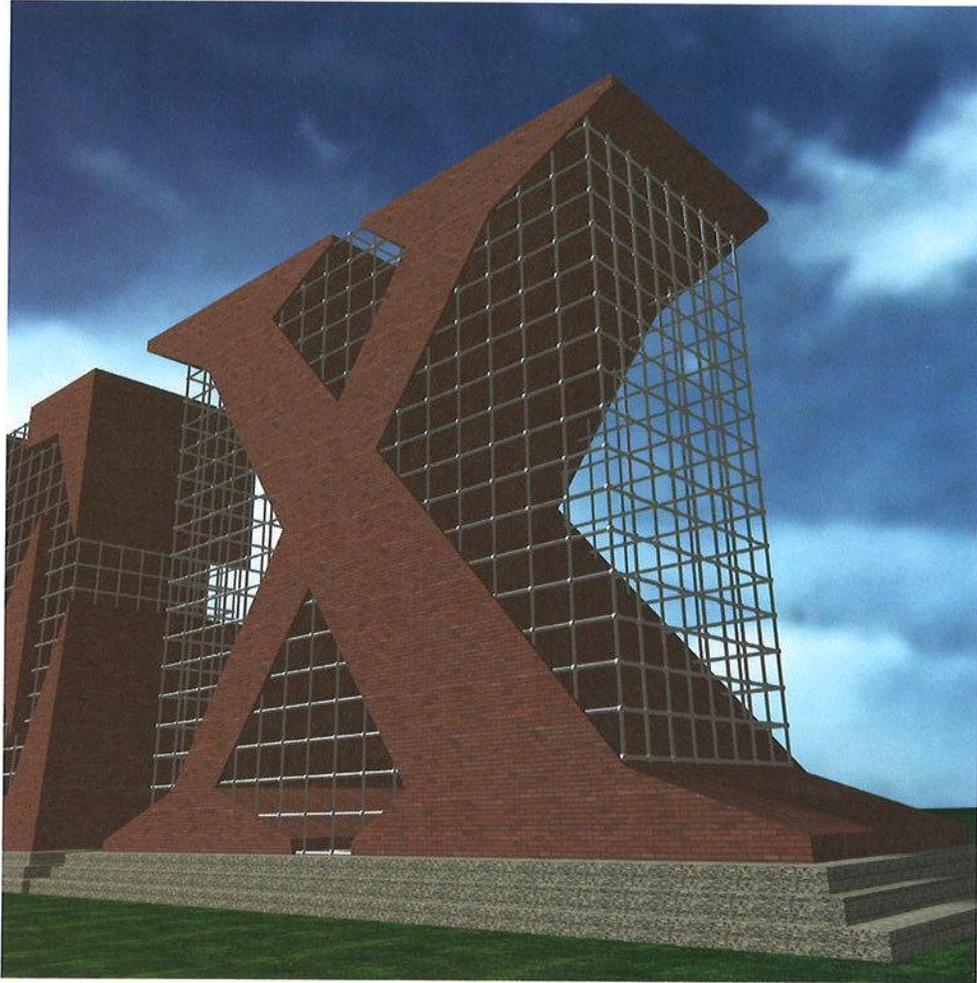
3. *Closure*: We group completed items together.



**Figure 3.6** "Closure" refers to our tendency to connect items together to create a more complete and understandable form or situation.

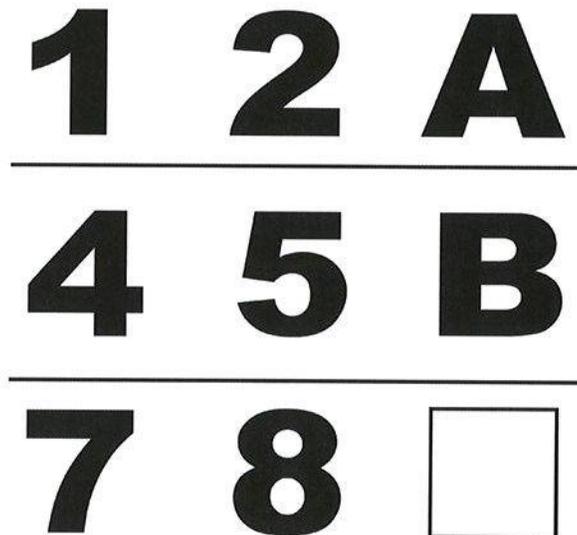
4. *Continuity*: We see as complete shapes that are implied, by bridging the gaps.

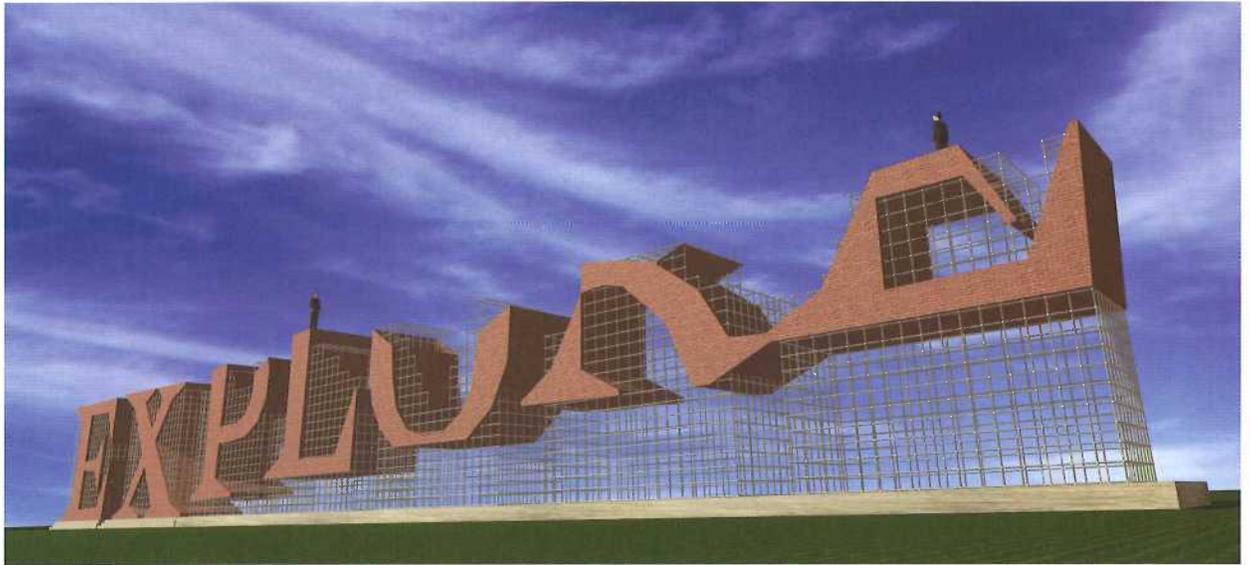
**Figure 3.7** "Continuity" describes how we will understand a form as a continuation of two or more forms. For example, we see the "X" as a continuation of two linear forms crossing each other, rather than two stacked "v's."



5. *Membership character*: We define a single part of a whole according to the context in which it appears.

**Figure 3.8** "Membership" refers to our assigning belonging and identity by the context in which an entity appears. The blank in this diagram can be easily interpreted as space for a letter or number by reference to its placement and relationship to the visible symbols.





**Figure 3.9** Humans are remarkably adept at pattern recognition. Once clued in, we automatically recognize, group, and interpret shapes and forms into understandable totalities. Our prior knowledge allows us to fill in the missing parts and connect and reframe until we get an understandable result. We will even go so far as to read into random shapes, such as when we see “faces” in rock formations, smoke, or pieces of toast.

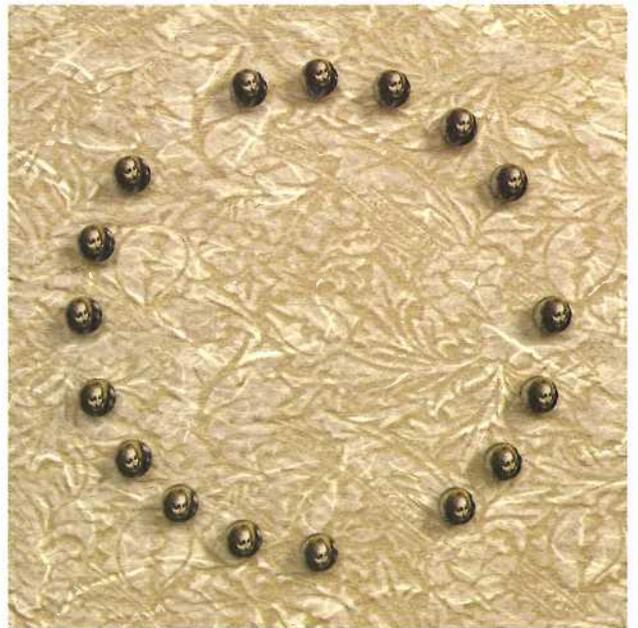
Pattern recognition is what allows us to fulfill the Law of Continuity. When we encounter a pattern that is incomplete, we can still recognize the object because we use our prior knowledge to close the pattern and create a whole.

An “open” gestalt means that you have enough elements to suggest a whole, but not enough to create the entire design. There are wholes in which all the significant elements are in their appropriate places or positions and in perfect accordance with the system principle; however, there are also wholes in which only a limited number of elements are in the correct positions, sufficient to suggest the system principle, while other elements are out of position. These two examples represent “good” and “bad” gestalt, respectively. The various degrees of *Prägnanz*, which a gestalt may have, express how well the various parts correspond to the intended whole.

There are also cases where a sufficient number of positions are occupied in a whole to indicate the system principle, while the other positions are not filled. These are “open” gestalten as opposed to “closed” ones, in which all significant positions are occupied.

Humans have innate abilities to create gestalten as good as the conditions—including the amount of information they have—allow them to be. All creative work, whether it is artistic or scientific, relies on and benefits greatly from this ability. Artists and scientists can assemble mental models and by analogy and intuitive thinking perceive the whole (the gestalt). This is how we can begin to sense things that are unknown and how we can create new concepts, theories, and knowledge by describing them. By trusting this ability, we can focus inward to fill in the gaps of our concepts and then outward to give direction to our presentations so our ideas are coherent.

**Figure 3.10** An “open” gestalt still has room for inclusion of new information or interpretation, while a “closed” gestalt has all the necessary elements in place. Here the gaps still remain to be filled, but the gestalt of the “circle”—the totality of the form—is readily perceived.



## BRAINSTORMING

Although many think of brainstorming as a group activity, it can also be a very effective tool for people who work alone. It is a process of spontaneously thinking and sharing as many ideas as possible about a topic without being judgmental. When we brainstorm, we take all the ideas and thoughts we have and look at them, play with them, and freely create connections among them, without having to worry about making mistakes.

### PREPARATION FOR BRAINSTORMING

You will begin to get ideas right at the outset of a project. Capturing these ideas is important. First impressions count; these are the seeds from which the project will grow. Carrying a notepad or using a voice recorder, capture your thoughts as they arrive.

Record everything; even irrelevant or bad ideas can serve a purpose later. They may lead to questions that produce better ideas. Any organization at this stage is better than none. Even a shoebox that you throw all of your notes into at the end of the day is better than having nothing, and could actually be quite effective if you go through it every now and then to gather the good stuff.

The most ideal thing, however, is to keep a design journal and sketchbook.<sup>1</sup> This should be a comfortably sized sketchbook for your day-to-day thoughts and discoveries and a folder or loose-leaf binder for a more methodical arrangement of individual projects.

In the sketchbook you should doodle, sketch, write down thoughts and observations, and collect images you find, copy, or photograph. It should be the net that catches everything that flies through your mind. This will only work if you have it with you all the time. Remember that it is a working tool, not a piece of artwork. While I was in college, I had the hardest time putting anything in my sketchbooks because I felt that everything had to be perfect and artistic. Once I got over this notion and began to use the books as visual notepads as well as diaries and to-do lists, they became essential and very helpful—if chaotic and messy—tools.

**Figure 3.11**  
Brainstorming can be performed in groups large and small. A particularly good method is to break larger groups into smaller units, each small enough so that everyone's voice gets heard. Typically, in a classroom such as this, groups of 3 to 5 work very well.



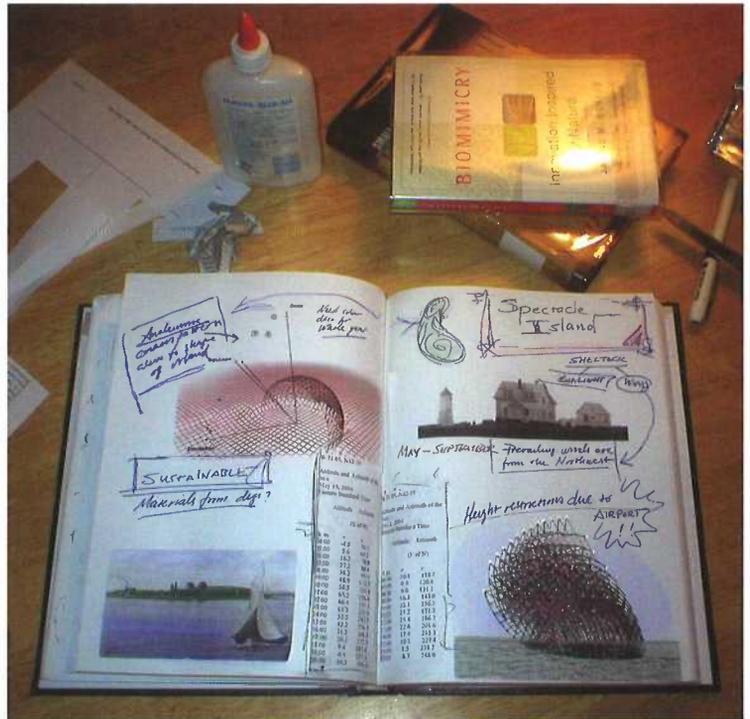
The design journal is the sketchbook's more mature, tidier sibling. In it, you collect and organize the material relevant to your project. As you may possibly want to be categorizing it as you go, it makes sense for the design journal to be a loose-leaf binder so that you can insert things and move them around. The journal entries may actually come from scraps of paper kept in the shoebox. You may be organizing by materials, concepts, a timeline, or whatever system seems relevant. But don't wait for the perfect system to show up by itself. Begin putting the journal together, and worry about rearranging it periodically. It is there to help you organize your thoughts, not just for show. The more elements you assemble, the better the gestalt.

### RULES OF BRAINSTORMING

Brainstorming by yourself is sometimes easier because you don't have to wait for others and you're not restricted by the rules of a meeting. What makes it difficult is that you don't have others to offer input when you are stuck or with whom to share ideas.

The rules for brainstorming either by yourself or in a group are very much the same.

- *Have an agenda.* At the beginning of the session, review the questions you have. What? Why? How? Be as clear as possible in describing the objective of the session.
- *Define success.* A brainstorming session may be successful even if you don't find the perfect solution. It may be enough to know in which direction the solutions lie or to have produced a set of options. This is also a good way to keep negativity in check. It is enormously liberating not to have to be perfect.
- *In a group, appoint a facilitator.* If you are brainstorming in a group, have one person be in charge of calling on speakers and recording and organizing the information that is flowing. Ideally, this should be someone with a lot of knowledge about the project. It's essential for the facilitator to prepare a list of questions, exercises, and reactions to possible scenarios. If possible, the facilitator also should be familiar with the participants. When trying to solve a very specific or complex problem, the facilitator should provide the necessary information to participants in advance. However, if the group is trying to achieve a new approach or vision, it may be best to have the participants come in uninformed, so they don't come in with preconceived ideas. The facilitator must be a neutral party, able to relate to a variety of personality types and able to control a situation in which one individual is overly influential.
- *Write all ideas down.* All ideas are valuable. The whole point is to gather as many ideas as possible. You can edit once everything is done.
- *Don't criticize ideas.* Include your ideas and other people's ideas. Be respectful and allow everyone to finish their suggestions or statements. This is not a forum for discussion or debate.
- *Deal with doomsayers immediately.* If the dreaded "it will never work" chorus begins to make itself heard, the facilitator must turn it around. "What will it take to make it work?" is a good question to ask to get back on track.



**Figure 3.12** The sketchbook is a working tool, not a work of art. Put everything in your sketchbook. Add notes, reminders, sketches, clippings—anything to help you keep track of your thinking and remind you of your process. (Better that your sketchbook be chaotic and messy rather than your brain.)

**Figure 3.13** There are all sorts of ways you can brainstorm. Using formal methods allows you to brainstorm by yourself or with one or more people. Regardless of how many are participating or how much is said, a system keeps the process going.



- *Focus on having many ideas.* The more ideas the better. Make sure everyone gets a say, and better still, make everyone speak twice.
- *Welcome hitchhiking or piggybacking.* After each suggestion, allow time to see if one idea sparks another similar idea or enhances an idea given by another. If ideas are flying around, make a quick note and come back to each one.
- *Encourage freewheeling.* The sky is the limit; outrageous and humorous ideas are accepted. This is a perfect time to be silly. If a spontaneous atmosphere is created, then the ideas will be even better.
- *Set a time limit.* When brainstorming sessions go well, they go really well. It's a good idea to set a limit (20 to 30 minutes is usually good for a group of 7 to 10 people) so that there is a definite cut-off point. The time limit helps to keep people engaged.
- *Edit and consolidate.* When all the ideas have been recorded, combine ideas as much as possible, taking care that nothing gets lost in the process.
- *Revisit.* Give everyone some time to digest the results, and follow up to review the information.

### BRAINSTORMING AS INSPIRATION

Brainstorming is an inspirational exercise as well as a focusing activity; all the points discussed in Stage 1 are relevant. Let's revisit.

- *Don't wait for the muses.* Brainstorming is a structured activity that should not be rushed through. You must know when you are good at it. The luxury of brainstorming is that sometimes you can set the schedule and the pace. Perhaps your flow of ideas is better at night. Whatever the framework, recognize and use it. You may have to be creative at a specific time (I have had some of my best brainstorming moments while sitting in an airplane for hours with nothing else to do). Anticipate moments (such as traveling or waiting rooms) where you'll have enforced quiet time and bring your sketchbook.
- *Be careful when letting the genies out.* When you are brainstorming, *all* the genies should fly out, but you must still be careful to spot the ideas that are relevant and let go of the ones

that are not. Since you have already set up some constraints in the thesis, this is easier than when you're starting out with nothing. Use the constraints to keep yourself on track.

- *Play outside your own backyard.* If there is one principle of creative brainstorming that is above the others, this would probably be it. It is absolutely imperative that you allow strange thoughts and new connections to be made. Include the obvious, but move on to the not-so-obvious and even to the obscure and beyond. Brainstorming is an opportunity to explore possibilities. You have your constraints to keep you from going completely off the map, but even then you may find that there are interesting territories at the uncharted edges.
- *All work and no play does not work.* Brainstorming is a game; it should be fun and exciting. You should stop as soon as you feel that it is becoming a chore. Occupy your mind with something else and come back to it. It is almost pointless to brainstorm unwillingly. This results only in ideas that are forced and probably substandard. Reconnect and move ahead.

### SIMILE, METAPHOR, AND ANALOGY: A POETIC TOOL KIT

In discussing inspiration, it was noted how the muse could focus the world and cause poetry. The focusing of the world allowed the poet to see things in a new way. We can use the same tools the poet used to communicate our vision, whether it is to ourselves or to an audience.

Simile, metaphor, and analogy enrich concepts. By appealing to known elements and things that are familiar to your audience (and yourself), you can create a mental/emotional resonance that creates new connections. These can then lead to still new concepts.

#### Simile

Simile is the comparison of two unlike things using the words *like* or *as*.

My pen moves along the page  
like the snout of a strange animal  
shaped like a human arm  
and dressed in the sleeve of a loose green sweater

This is as effective as it is simple. The comparison allows us to visualize the intended meaning and give it the added dimension the signifier allows. The added dimension allows us to step away from the surface and see things in a new way. The pen and the writer's arm have a life of their own; an image that becomes only too clear in the following lines:

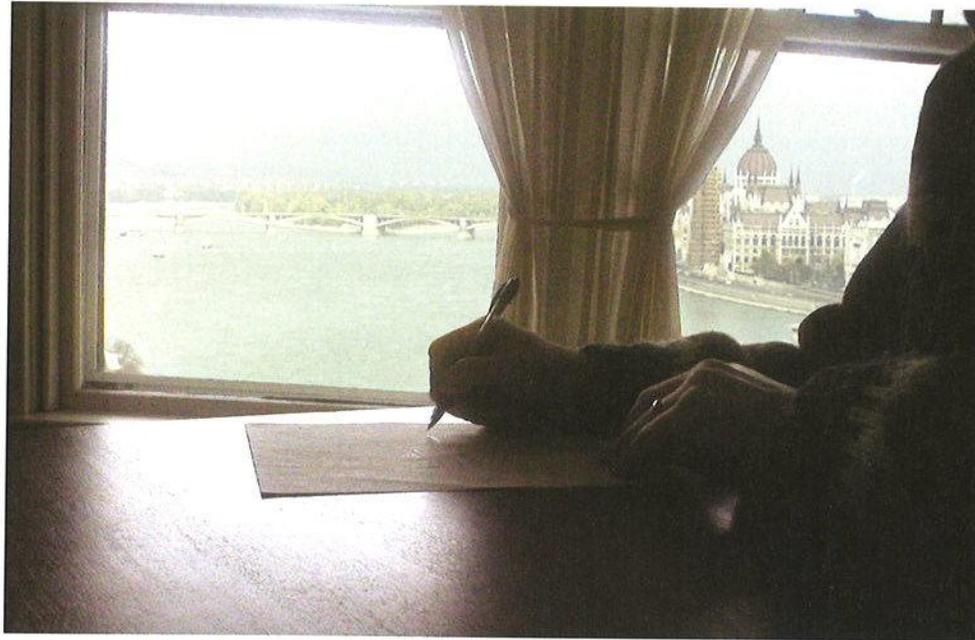
I watch it sniffing the paper ceaselessly,  
intent as any forager that has nothing  
on its mind but the grubs and insects  
that will allow it to live another day.

Having set us up with the image of the pen and arm as an animal, the poet broadens the image and eventually separates himself from his writing arm altogether.

It wants only to be here tomorrow,  
dressed perhaps in the sleeve of a plaid shirt,  
nose pressed against the page,  
writing a few more dutiful lines  
while I gaze out the window and imagine Budapest  
or some other city where I have never been.

—"Budapest" by Billy Collins<sup>2</sup>

**Figure 3.14** We can brainstorm by allowing our imagination to wander while engaging in creativity. Writing or sketching as we go, using sketches and written language to express what appears in our mind. Poetic language, metaphor and simile, allows a bridging of the world of thought with the “here and now” of known things.



You can approach your concept and describe it using a simile. The simile leads to questions that give rise to constraints. These can then be explored in a brainstorming session. So if you decide that your concept is like a leaf, then you ask how it will be like a leaf, what kind of leaf it will be, and how large it will be.

#### Metaphor

In the poem “Budapest,” Collins shifts quietly from simile to metaphor, when suddenly there *is* an animal rather than something *like* one. In presenting a concept, this kind of shift is extremely effective. It brings us into the world of the idea.

A metaphor sets up a more immediate relationship between the concept and its description. It omits the *like*, instead equating the subject directly with the signifier, as does the extended metaphor in a verse from W. H. Auden’s “Funeral Blues.”

He was my North, my South, my East and West,  
My working week and my Sunday rest,  
My noon, my midnight, my talk, my song,  
I thought that love would last forever: “I was wrong”

Consider the difference between being someone’s working week and being *like* it. If you say, “The building is an organism,” we would be able to discuss what its skin may be, what its bones are, and how its organs function. We begin to delve into its nature. Discussing your designs using metaphor allows you (and your audience, if there is one) to begin to inhabit the idea rather than observe it.

A poem is a communication of a vision. It is energy transferred by the writer to the reader. The writing of it is not only an act of creation, but also a presentation of a vision.

By using metaphor, you set up a mental image and, in doing so, create a resonance between the unknown that you are introducing and the known. The familiarity allows you to understand the concept on your terms and begin to claim ownership of the images and ideas.

### Analogy

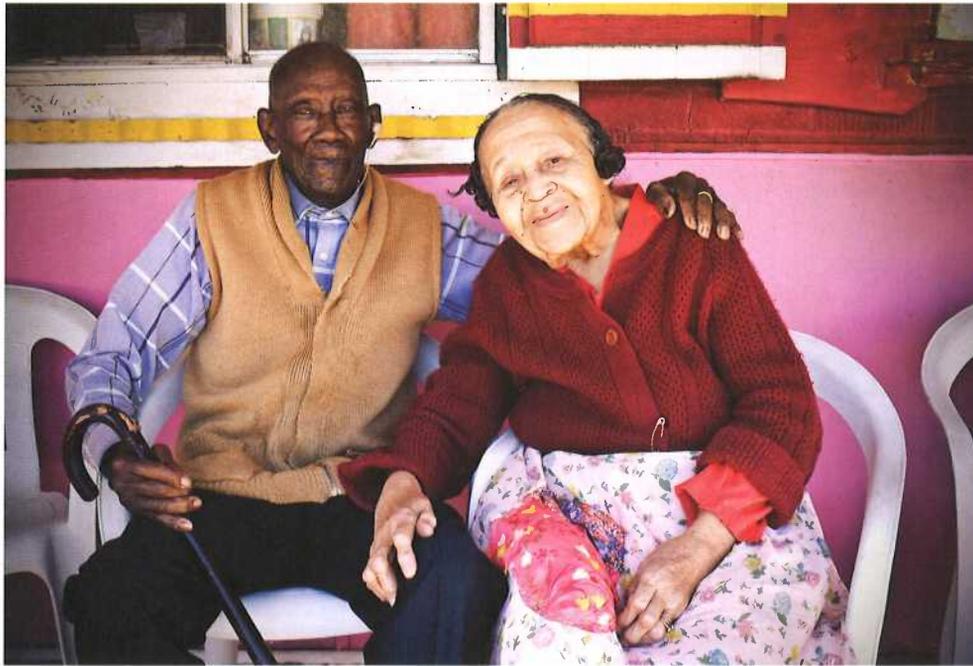
An analogy is a comparison in which different items are compared point by point. Extremely common in science as well as art, an analogy is usually used to explain something unknown by comparing it to something known. Scientists have compared atoms to billiard balls, brains to computers, and the underlying structure of the universe to vibrating string.

An analogy can help our understanding of structures and systems by pointing out similarities. Traffic analysis in civic planning uses analogies between the flow of gases in closed environments and traffic on highways. The rules that have been clearly demonstrated in one area are used to infer the behavior of the other.<sup>3</sup>

Analogies can point out relationships that may not have been visible, but they have their limitations. Analogies can “break down.” That means that they are only suggestive and do not follow in every detail. In other words, analogies and metaphors don’t prove anything, nor are they “rules.” They are merely useful in helping people see similarities that are not otherwise apparent.

In the early days of flight, designers modeled wings on the wings of birds, following the assumption that the analogy would hold. (Da Vinci actually did some of this as well.) It does, but only up to a certain point. The shape works, and with modification and design applicable to the scale needed, aircraft were developed.

When you present a concept, set up an image of known relationships and elements. Then attach the whole mental framework to a known element: “The curvature of a wing sets up drag and lift allowing the bird to glide easily. I will base my design on a bird’s wings . . .” From this starting point, you and your audience can create a good gestalt.



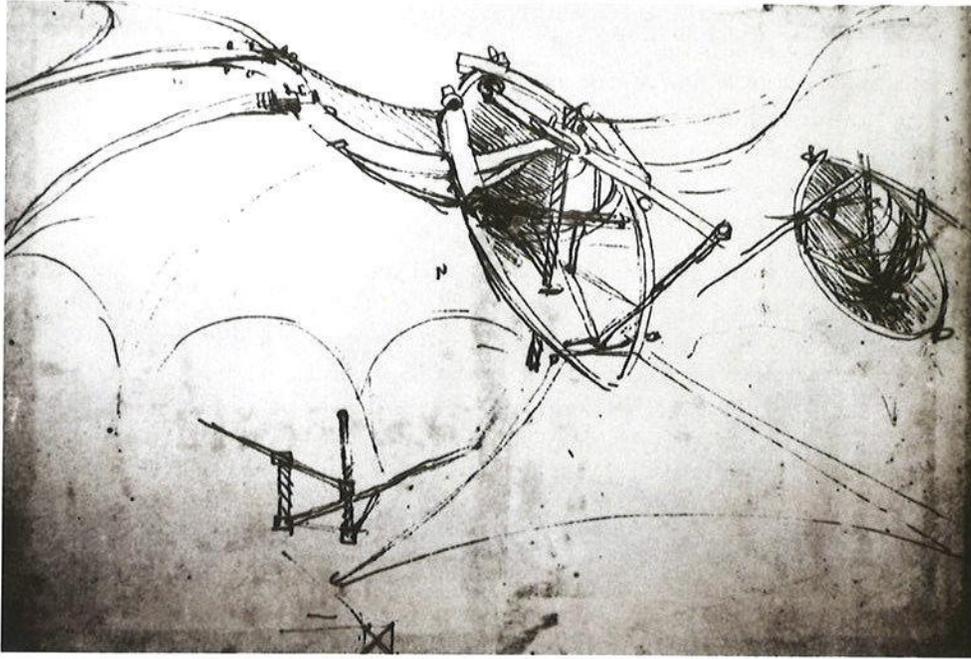
**Figure 3.15** A metaphor is a description with far greater power of engagement than a simile. Consider describing a loved one as *being* your “working week and my Sunday rest” rather than *being like* your “working week.” The metaphor engages with the existence of both. Using metaphor to describe a design is, therefore, a very powerful way of bringing your audience into direct involvement with the idea.

### BRAINSTORMING TOOLS

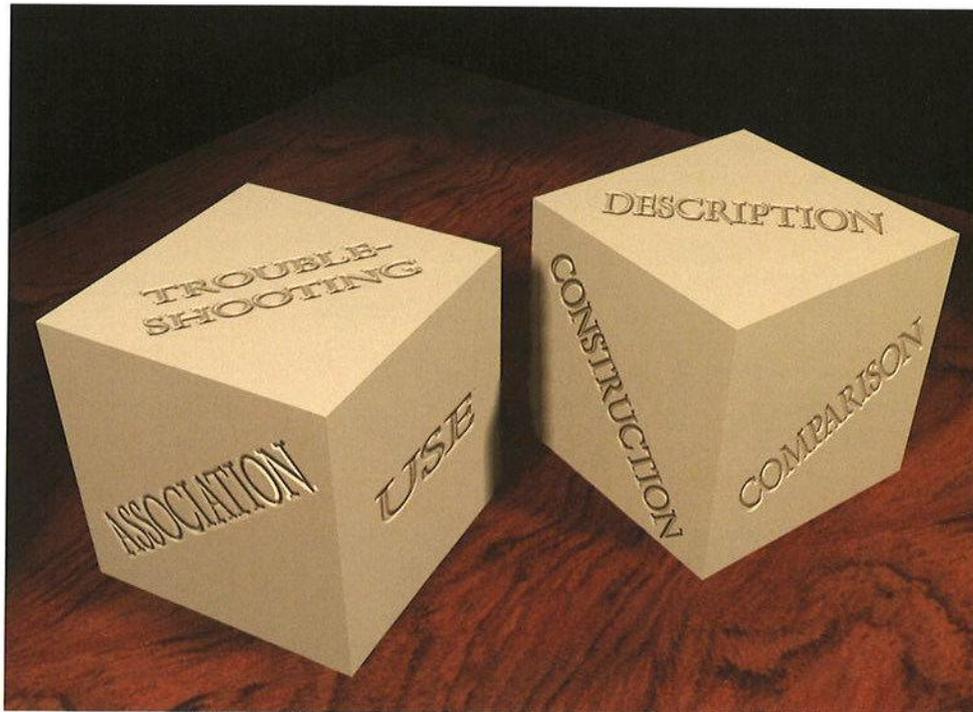
Cubing asks you to examine your concept from six different perspectives. Like webbing (see page 95), it is an excellent tool for rapidly describing a design. It reveals quickly what you know and what you don’t know, and it may alert you to decide to narrow or expand your topic.

Give yourself three to five minutes to sketch and write notes from each of the perspectives listed here. Start from what you know, and identify those areas that will need further thought

**Figure 3.16** Da Vinci based his ideas for flying machines on natural forms. The analogy is sound and the assumption carries the ideas far, but in the end the engineering has to be adapted to the reality of weight and scale. Just making it like a natural wing is not sufficient to make the user fly.



**Figure 3.17** Cubing invites you to examine your concept from six different perspectives. Each side of the “cube” (real or otherwise) describes one of six different aspects of the concept. This simple exercise forces an examination of the concept and its limits and can move thinking far down the road in a very short space of time.



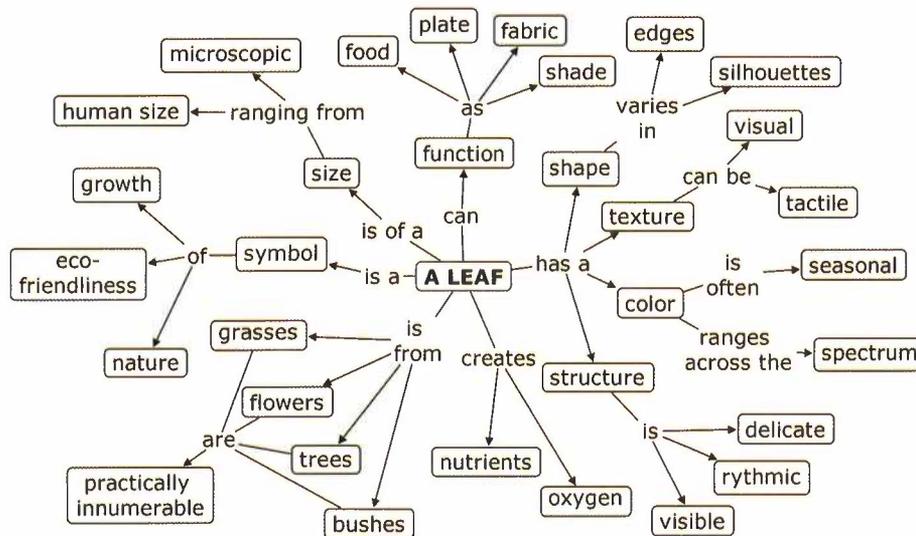
or research. Speculate about where you will discover this information. Don't dwell on what you don't know; keep going until you have written about your design from all six perspectives. Remember there are no wrong answers in a brainstorming activity. Look for surprises, unexpected insight, and connections.

- *Description:* Physically describe your design. What does it look like? What color, shape, texture, and size is it? What are the major components? What are the significant details?
- *Comparison:* How is your design similar to other topics, things, or designs? How is it different? How is it better?

- *Association:* What other design or thing does your design remind you of? Can you compare it with anything else in your experience? Use simile and metaphor.
- *Construction:* Look at your design's components. What purpose do they serve? How are these parts related? How is it constructed?
- *Use:* What can you do with your design? What purpose does it have?
- *Troubleshooting:* What are the pros and cons of your concept as it now stands? Consider budget, ease of manufacturing, and marketing.

Concept maps are tools for organizing and representing knowledge. They are constructed of “nodes” and “connectors.” The nodes are usually circles or boxes containing nouns representing the concepts. A connecting line between two nodes indicates relationships between concepts. The connectors often carry labels that describe the relationship.<sup>4</sup>

Begin by identifying the central word, concept, research question, or problem around which to build the map. Create your first node, and write this identifying information inside it. Then consider what concepts, items, descriptions, or questions you can associate with this node. Create new nodes and draw connections to them. If you can, add labels to the connections.



**Figure 3.18** A concept map of a leaf describes the various attributes and components of the leaf. A designer may take from these as many or few as will make an interesting set of constraints within which to work.



**Figure 3.19** For this tray, consider the concept map above and find which of the elements identified there wound up in the final design. It is also interesting to note how the design would have demanded different choices for different applications—say, if the designer had been creating plates, or silverware, or furniture.

**Figure 3.20** Concept mapping is actually quite simple. The central concept is identified, and then related concepts are added and the connections between them noted. Using nouns for concepts and verbs for connections makes things clearer, and simplicity is always good. But don't force over-simplification at the expense of getting the idea down. Editing can come later.



The following are some suggestions for creating concept maps:

- Approach from top to bottom, working from general to specific, or use a free association approach by brainstorming nodes and developing links and relationships.
- Try to avoid writing entire sentences in nodes. A sentence usually indicates that there is more than one concept, and therefore more nodes, involved.
- Conversely, don't force yourself into a bulleted style. Don't sacrifice elements of your thinking to pare down your word count. You can always edit later. The beauty of creating concept maps on a computer is how easily you can add items and move them around.
- Use different colors and shapes for nodes and links to identify different types of information.
- Use different color nodes to identify prior and new information.
- Using sticky notes for nodes can be helpful at the beginning if you are very tentative. Just move the nodes around.
- If you have a question, create a node and mark it. (Use a cloud-shaped node or a question mark.)
- Gather information relevant to a question in the question node.
- Look into the available software for concept mapping. The Institute for Human and Machine Cognition (IHMC, University of West Florida) has excellent software on its website that you can download for free.<sup>5</sup>

Webbing is the same as concept mapping but concerned only with connections and not direction or hierarchy. Place a topic of interest in the center and draw connections to supporting details or related ideas. This is a good way to quickly assess how much you know about a given topic. Webbing is not as structured as mapping and can be a good way to begin a brainstorming session or to think on the run.



sion. By listing pros and cons, you can choose between options or determine that your ideas are desirable. It is a fairly safe bet that considering the life cycle of the intended product with sustainability in mind will lead you to a *long* list of pros and cons. This can be a good way to wind down a brainstorming session. But be careful; if opinions are strong, “pros and cons” can turn into a very lively (and time-consuming) discussion. Make sure the parameters of the discussion are clear before beginning in order to keep heated discussions from veering too far off track.

### VISUALIZE AND SKETCH

Words and logic can take you so far, and visualizing will take you even farther. Follow up your brainstorming by sketching and collecting images related to the ideas. Whether it is in the form of diagrams, technical sketches, doodles, or illustrations, the visual element of the project must come into play as soon as possible. The design in question may be a highly visual project, but we must also allow for the kind of thinking that visual stimuli and feedback bring us. An answer to a problem that cannot be stated in words is often easily conceived in a sketch.

Creating concept boards and tear sheets of found images is a very effective way of getting your message across. This can work both for actual visual elements as well as more emotional effects.

### SCAMPER

A very effective tool for gaining insights into a developing concept is the SCAMPER process. It allows you to transform your concept in various ways, test the inherent constraints, and determine the strength of the concept’s nature. The SCAMPER technique also highlights the fact that you should never take anything about your concept for granted: There is always another way of doing something. Not every part of the SCAMPER process may be applicable every time, but the exploration will enhance your knowledge of the project and expand your vision. If the results of SCAMPER-ing do not fit your purpose, it is good to know they are there for the next round. It is also worth noting that that after each approach in the SCAMPER acronym, one can add “. . . for environmental sustainability.” What can you shift, change, manipulate toward less environmental impact?

The steps represented by the acronym are as follows:

- *Substitute*: Replace something with something else. You may, for example, change the materials or any of the components. (Use the Elements and Principles discussed in Appendix 1 to help you identify what may be altered.) This, of course, is especially important when designing environmentally sound products. Try making subtle changes, but also try something completely unorthodox, extravagant, or even ridiculous in order to widen your perspective on the project. *How about a rubber teakettle or a rough ceramic finish rather than china? Plywood pants or just a slightly thicker fabric? Substitute components: Metal buttons on a coat instead of plastic. A wooden handle on a knife instead of a metal one.*
- *Combine*: Blend or add elements together. Can something serve two purposes? Can two forms be fused? Can a contrast be eliminated? *Can the fabric of the upholstery also be in the curtains? Can you continue the handle of a knife so that it becomes the blade?*
- *Adapt*: Make adjustments to answer different or more elaborate demands. What else can it be? Where else can it work? By examining and playing with the design’s inherent functionality, adapt it to more needs. *Can the jacket’s design be applied to other garment types? Can a piece of furniture be put together in more than one configuration?*
- *Minimize/Magnify*: Reduce or increase the shape or form. Play with proportions and scale. *What happens to a car if you put oversized wheels on it? What if you make the windows on a house tiny? What elements of a couch can be huge? How big or small can the buttons on a shirt be? When is a pen too big to use? When is it too small? (Why would you push these boundaries?)*



Presentation and communication skills are discussed in more detail at Stage 6, but here are a few do's and don'ts.

#### DO

- *Practice your presentation.* Even if you are presenting to your colleagues, you are still “making a sale.” There are probably many points to cover and many questions to anticipate. Go over your materials and talking points and make sure you know the order and scope of your information.
- *Cover all the bases.* What are the elements of the concept? Make a checklist of all possible constraints: form, function, color, line, scale, materials, textures, fabrication, and so on. (See Appendix 1: Elements and Principles of Design.) Make sure your presentation addresses all the constraints you can think of. You should also mention the ones you can't address and explain why you can't. These “problem areas” often turn out to be the most interesting parts of the project, since this is where something new has to happen. Often, now that they understand your project, the audience may have helpful suggestions or insight into problems.
- *Speak to your audience.* Consider who is listening and what they need and want to know. All audience members are interested in their own “bottom lines,” whatever that may be. Production is interested in production issues, design is interested in design issues, management is interested in budgets and scheduling, and clients just want to know that the concept works.
- *Be enthusiastic and excited.* If you're not, how is anyone else going to be? You have to interest everyone in going ahead with the project and make them understand why it is worth doing.
- *Welcome all feedback.* Look at it as an extension of brainstorming. Even those who assisted in the development of the concept may already have new thoughts now that a little time has passed. The concept is now presented as a totality, which may bring new things to light. Criticism at this stage should always be taken in a constructive way, no matter how difficult it may be to hear.
- *Present options.* If there are several equally possible solutions emerging, show all of them. The feedback you get may determine which is the very best. If you don't feel comfortable about showing more than one, then the options may not be as equal as you think. If you favor one option over the others, you have a choice: either present it as the only option,

**Figure 3.23** In the end, the presentation relies on creating an understandable whole in front of an audience. Do not disregard the importance of your physical presence and spoken word. This student designer, presenting her work to a class at the University of Rhode Island, ties everything together in her verbal presentation.



or build a strong enough case for it in comparison with the others. Otherwise, be ready to have the audience choose the option that is not your favorite.

- *Bring samples and as many visuals as you can.* Words are never as effective on their own as when they refer to things we can touch and see.

#### DON'T

- *Assume knowledge on behalf of anybody.* Better to give too much information than to leave your clients or colleagues in the dark or confused. Cultural and scientific references should always be clarified. (Consider the information found in Appendices 4 and 5 on trends and the “spirit of the time.”) If you must go into complicated issues, consider preparing a handout. If you are worried that you are boring your audience with information they already know, you can simply ask them to stop you if they’ve heard this.
- *Assume that anything is obvious.* Never assume anything is clear or known. Murphy’s Law is in full effect here. The one thing you neglect to cover will be immediately misunderstood in direct proportion to the cost of the resulting problem.
- *Gloss over gaps or problems.* If your brainstorming and analysis have not solved something, the gaps or problems are probably greater than you think. It is better at this stage to highlight the gaps and let everyone know where matters stand. No one will appreciate the buck being passed, and clients get very upset if they think they are being kept in the dark. If you must admit to a problem, do so in a constructive way by asking for a brief dialogue. The audience may volunteer a solution.
- *Present filler.* Keep your presentations to the point, and don’t spread on the frosting just because you have it. Everyone can spot “filler” in a presentation and no one appreciates having their time wasted.
- *Spend more time on the content than on the presentation.* Unless the gilded frames, papier-maché boxes, and fireworks are directly helping to explain the concept, leave them out. It is very embarrassing to see a concept be outperformed by its frame. It is also distressingly easy to spot when someone is trying to hide behind slick technique.
- *Present inaccurate or half-finished models or drawings.* No matter how often you say, “This isn’t finished” or “Oh, that’ll be different,” the clients will take away the image of what they saw, not what you explained. If you have to present a half-built model, for example, don’t present it as if it were finished. Show it in pieces, or in a way that highlights its “in progress” state. It is often good to present elements and not whole images. The gestalt is coming together in the audience’s mind; showing them things that are wrong could fundamentally confuse their understanding of your concept.
- *Assume that presentation technology will work (especially if it is not yours).* Test, retest, and have backups of all digital media. Allow for time to hook up equipment, boot up laptops, and so on. If you are the least bit unsure about the reliability of the digital equipment, have physical backup material. Better still, have a presentation that doesn’t rely on uncertain technology at all.
- *Panic!* The fear of public speaking is the fear of making a fool of yourself. When giving a concept presentation, be aware that your audience is there because they are interested in the project, not in your performance. As long as you know what you need to know and have a good grasp on the ins and outs of the concept, you will be forgiven for not being a star of stage and screen. However, letting your enthusiasm carry you is always a good idea.

## JILL PABLE, INTERIOR DESIGNER, PROFESSOR OF INTERIOR DESIGN

Jill Pable is an associate professor in the Department of Interior Design at Florida State University and an NCIDQ-certified interior designer. Her education includes B.S. and M.F.A. degrees in interior design and a Ph.D. in instructional technology with specialization in architecture. Jill's professional work includes residential, hospitality, healthcare, and office projects completed within her own firm as well as with Universal Studios Florida theme parks. She is the past chairperson of the Interior Design Continuing Education Council and national president of the Interior Design Educators Council. Her service and research focus on education and service to others, and she believes passionately that design holds great potential to help make the world a better place. Her educational papers and creative works have been awarded "best presentation"

at international and regional educational conferences six times. Her books *Interior Design: Practical Strategies for Teaching and Learning (with Katherine Ankerson)* and *Sketching Interiors at the Speed of Thought* are published by Fairchild Books.

I come from both a teaching and a practice background, and as a result, I keep one of my feet in the realm of practicality and the other in the realm of possibility—and sometimes theory—so mine might be a little different path from that of others, but I think it's a strength and has worked well for me.

My path in college took me from a major in music and a minor in biology, to geography, meteorology, and restaurant management before coming to interior design. I wouldn't trade that experience for anything. My biology minor required me to take a seven-week cross-country field biology survey through North America, Mexico, and Canada. There it dawned on me that design touches on everything: it touches on the natural world and on resource depletion; it touches species when we disrupt a site. My exploration of meteorology and geography brought in natural elements, too. My look at music impacted aesthetic aspects, and I see great parallels there with how we design. I think a well-rounded approach is never a waste.

After obtaining my undergraduate degree I practiced for a couple of years and was then invited to teach. I was so enamored with it that I decided to go back to school and changed my career to teaching. I received an MFA in interior design and then after a few years in the Midwest came to Florida to work at the Universal Studios Florida in its theme park environments. At the same time, I completed my doctoral program. I then taught interior design in California for a few years before being lured back to Florida.

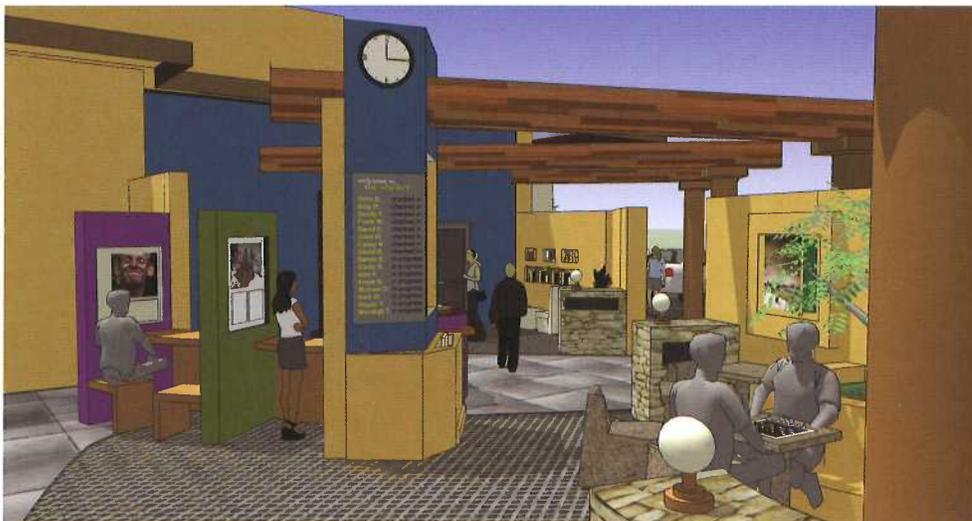
I certainly couldn't claim that this is right for everyone, but design is primarily a professional endeavor, so having a hand in practice can be a tremendous asset. I also think that there is insufficient connection between design theorists and practitioners; there isn't enough discussion between academics and people in the field. One thing I learned in my practice was dealing with healthcare environments, something to which I've now returned. It's made me learn a lot about how we go about designing and what we prioritize. I've learned that we have to approach the problem of designing an environment for people in a way that may be very different from before and that we need to reassess how we gather information in order to design well, especially for certain populations. People have used a lot of ways to gather information about end users in order to design for them, which may be helpful at times, but I'm not sure it's going far enough. When designers need to learn about users, they do case studies

or interviews or put together questionnaires. That's all fine and very helpful in some cases. However, I would suggest in regard to designed environments—especially those that are made to rehabilitate or help people heal—that we need to go beyond just asking the users. This is because sometimes the users themselves may not know what is needed in an environment in order to help them heal well.

My area of research interest in the past three to five years has been with homeless people. This is a group that I've come to learn is in great crisis and has critical needs. I don't think that the current environments that serve this population are doing all they can to help these people heal. For that reason, I've started looking into other opportunities and other ways of even thinking about how we gather information to design well for healing. Specifically, I'm looking to theories that lie outside of architecture and design that can help us reprioritize and certainly help recalibrate what we think about and what priorities and values we put in place for our design programming. For example, one framework that we might use to think about programming lies in the theories of wellness psychology.

I'm especially fond of Abraham Maslow's self-actualization theory: It suggests that within each of us is great potential to be a highly adjusted, kind, giving, and friendly person. However, the fact is that life sometimes prevents all of us from reaching that state, and some of us have had experiences that greatly block progress toward this fully human state. It might be possible to take a theory such as this and have it serve as a framework so that the environments that we create have the aim and greater potential of affecting healing, rather than just fulfilling what the prospective users say they need.

Here is an example of how application of these ideas might work. Maslow's theory says that people who are self-actualized possess qualities such as having a greater social interest in the people around them—they are interested in what other people are doing, and they're not self-absorbed. What I'm currently thinking about is creating a thinking tool called a theory-to-action grid. This tool would allow a designer to take that characteristic—increasing people's social interest in each other—and put that alongside other types of theory structures, such as Christopher Alexander's patterns (which offer guidance on how to design humanely), crime prevention through environmental design (CPTED), and sustainability. There are many other theories that can and should be considered as well. What seems to result is a series of distilled recommendations that spring from all of these theories simultaneously but have their grounding in human wellness.



Let's say we're designing a space for homeless people to sit while they wait to see whether they're being admitted to a homeless shelter on a particular night. It's a highly stressful place to be. One can provide seating configured to allow people to interact—perhaps there's a chess-board, for example—and nearby perhaps a half-wall that would allow another homeless person to lean in and interact but doesn't compel that person to do so. In this way, the designer has taken the ideas of security and social interest and derived out of them specific architectural responses. That's one of a dozen suggestions that have arisen from a theory-to-action grid approach. The whole idea is to let theories that are published and successful actually start to affect our environments. The main point is this: if we tap other theories, such as psychology or sociology, and go beyond just asking users what they want, then we will design environments that are more likely to help people heal than if we don't.

Another of Maslow's self-actualization theories suggests that we need to instill respect so that it builds into personal relationships and good empathy toward each other. This elegantly meshes with the sense of protecting the natural world. One might, for example, in the waiting area of the homeless shelter, create a series of solar panels that allow people to see that we are collecting energy from the sun and it's actually powering the facility. We might also make it clear that the rainwater is collected and channeled into very visible collectors from which the vegetation in the area is nourished. I think people who need to heal have an especially strong need to actually see respect for the Earth in action. That's another reason we need to think holistically.

Designing in this integrated fashion frees us to tap the knowledge from other fields, and it's critical that designers seek out information that other disciplines have already discovered about our user populations. This idea is affecting my current research endeavor. I've found that many psychologists have been conducting studies on the effects of crowding in homeless shelters and dormitories and reaching very helpful conclusions about the effects of these conditions. (It's not unusual for a family of four to inhabit a 9' x 12' bedroom.) These researchers suggest that highly controlling shelter environments may lead to a sense of helplessness in their homeless residents, which in turn can discourage these people from job-seeking and returning to a normal lifestyle. Therefore, I believe there is an opportunity here for interior design researchers: what if small local controls were added to a shelter dormitory room, such as local lighting so that a mother could read to a child in bed, or a fan to make the room cooler, or privacy curtains to permit a sense of ownership over one's bed area? Might these measures, in some modest fashion, increase one's sense of self-empowerment? Interior design decisions such as these may hold great potential for healing, in my opinion, and activate the consensus of conclusions from other disciplines.

I think designers have been guilty for a long time of designing with blinders on, and we no longer have the luxury of designing in ways that we have in the past. I agree with Sim Van der Ryn who, in his book *Design for Life*, describes that we are entering into what may be called "the integrated age" when we must design collaboratively with many different points of view in mind and an eye toward cultural, historical, functional, and sustainable goals simultaneously. We must design holistically in order to serve humans, who are very, very complex creatures.

One thing is becoming very clear: designers must work more regularly and collaboratively with other groups. We can no longer afford to stay in our own little cave and think great thoughts and develop solutions that nobody builds. We're going to have to work with professionals and students of psychiatry as well as biology, journalism, graphics, history, and English. I think future design teams must have ethicists, historians, and cultural experts on them in order to grasp the complex challenges ahead. We need to think differently as interior designers, in ways that permit different ways of knowing things. We can no longer afford to think of values and priorities in a fractured way.

The world, in fact, turns out to be a lot more complex and challenging than where we as designers have so far been. In fact, what we need is the ability to combine different priorities in different ways. We must, for example, consider sustainability, but not as we have considered it until now. We have tended to think of sustainability almost as something separate, and as long as we continue to do that, sustainability will be this stand-alone add-on that never really gets embraced at the bedrock philosophical level where it should be. Right now we have this separate “green” kind of approach. What we need is a restorative type of thinking about it, an intuitive, regenerative way of doing business. Our students are leading the way with this. They are very concerned about materiality; but sustainability is about so much more. It is about a whole new way of looking at our priorities.

Design seems to be held in much higher regard today than it was when I was in undergraduate school, and that’s good. Students today have a different, positive, view of design. There’s been a tremendous popularization of design in the past decades, and its democratization means design is no longer just for the wealthy and those who can afford it as a superfluous activity. There are a lot of implications connected to this: designers are expanding in terms of their numbers, but there’s also the effect of raising the bar for what’s expected of designers. I believe we’re going to be held to higher standards stemming from higher safety concerns and heightened aesthetic requirements, as well as other areas—but this is all positive for users, designers, and our society in general.

I guess, as for anybody, my sources of inspiration have evolved as I’ve grown and learned. At this point in my career, I’m inspired at the thought of making a contribution to the design of interior environments for underprivileged users. When I interview these individuals and the social services staff that serve them, I am struck by their resiliency, selflessness, and ability to maintain a positive attitude in the face of great adversity. Their kindness and humility make me want to help. There is much to do for the 98 percent of the world’s population currently unserved by thoughtfully designed interior environments.

I believe this is a time of great opportunity for design and designers. I say this not only because of the rise in public awareness of design, but because we’re starting to learn more about what good design can do, not only physically but also mentally; not only for human beings, but also for the natural world. How well might designers lead if they felt empowered to do so? For it is designers, I believe, who have the ability to think in an integrated fashion the world increasingly demands. Our potential is great: in a 1988 essay titled “Immateriality Takes Command,” Marco Diani wrote, “Design could become the essential, required link, or third factor, between the unilateral growth of science and technology and the human/cultural complexity of postindustrial society.” Designers, in fact, have the habit of pioneering ways of thinking that empirical science is now only catching up to—witness the rise of the exploration of intuitive thinking among neuroscience circles, for example.

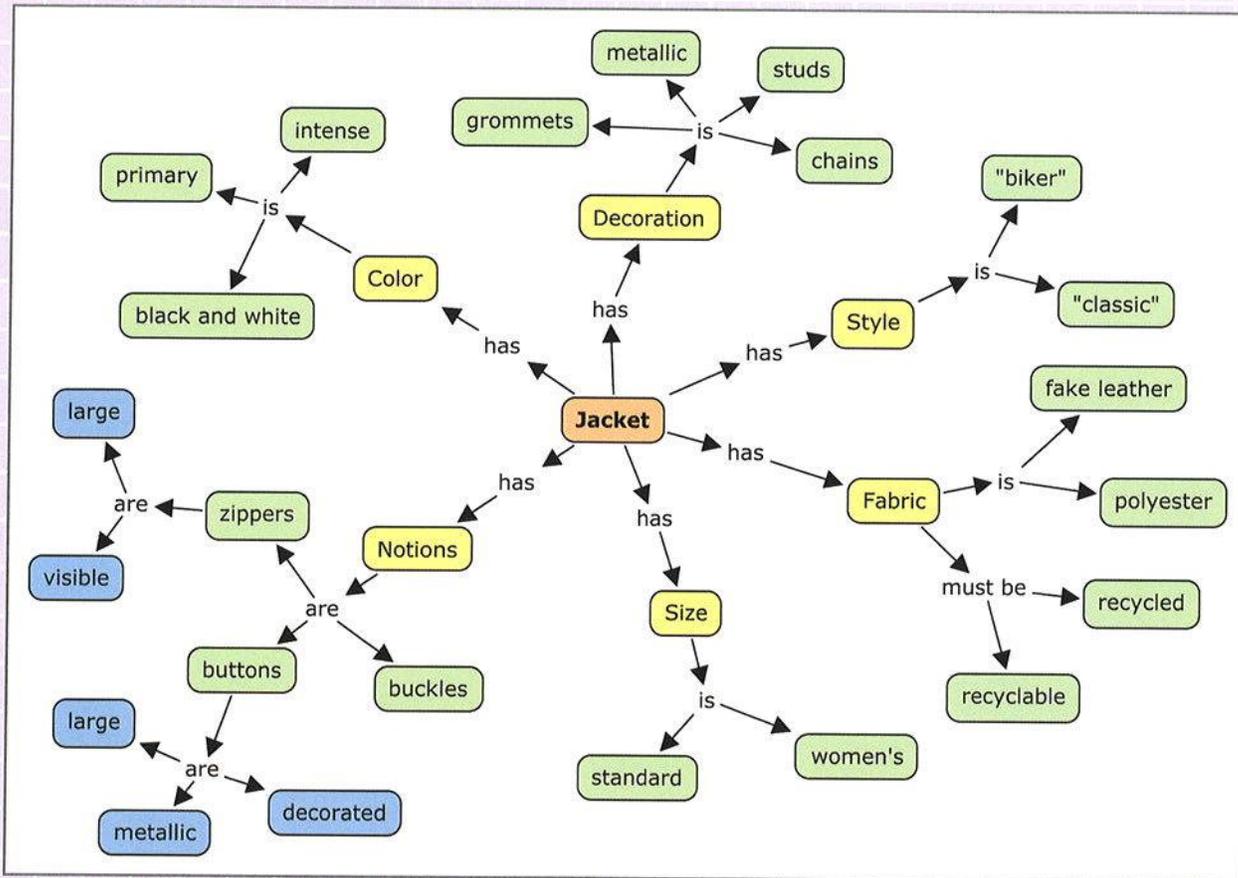
Essentially, it is time that designers rise to the significant challenge that our increasingly complex world demands. The solution, I feel, lies in a holistic approach that challenges our current way of thinking.

Reference: Van der Ryn, S. (2005). *Design for Life*. Layton, UT: Gibbs Smith.

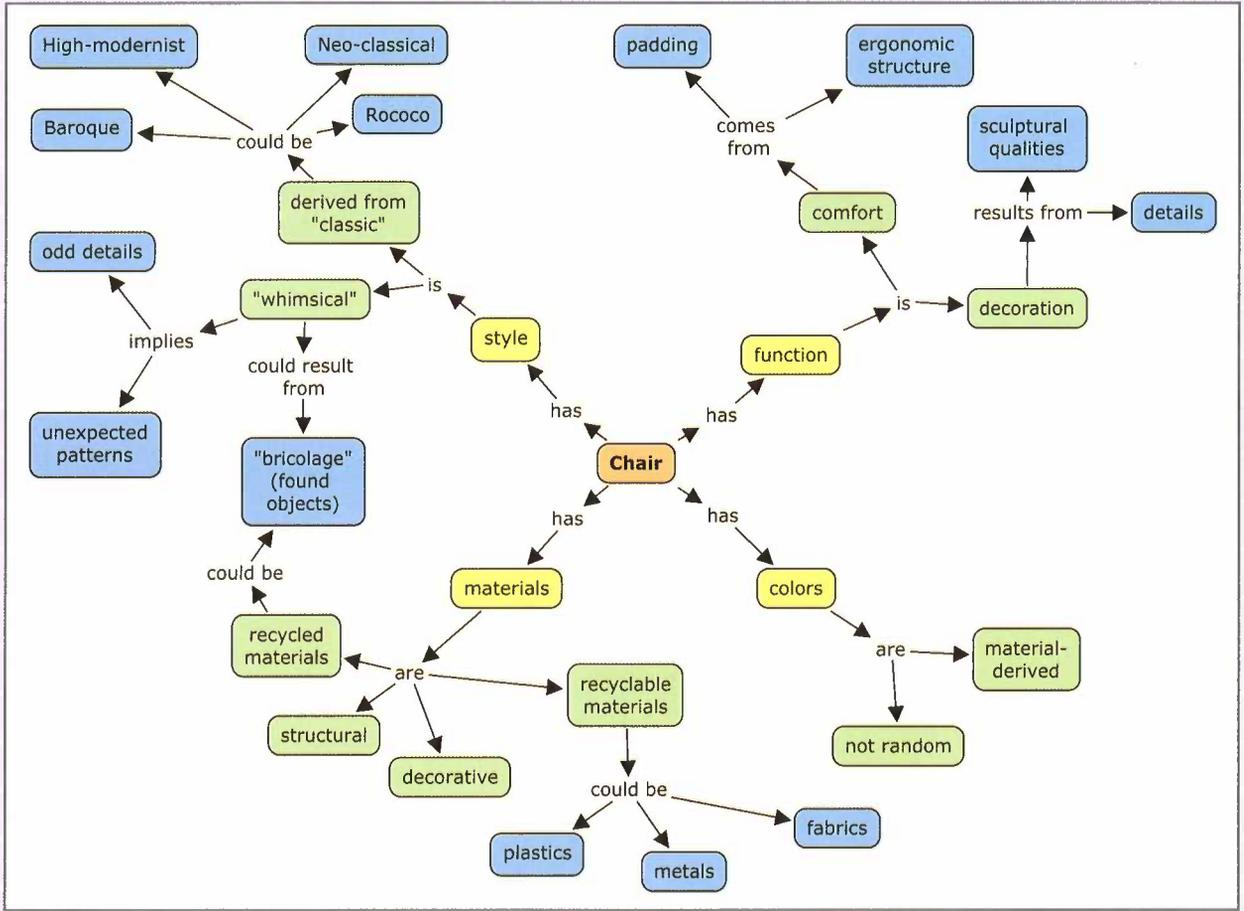
### STAGE 3: CONCEPTUALIZATION

Create a concept map by noting the basic components of the design and adding links that describe their relationships. Notice how, with all three maps, the fourth level becomes the one where a design decision needs to be made, in the form of a definition: this color, these textures, that material . . . until you are ready to begin applying the ideas concretely in sketches and models.

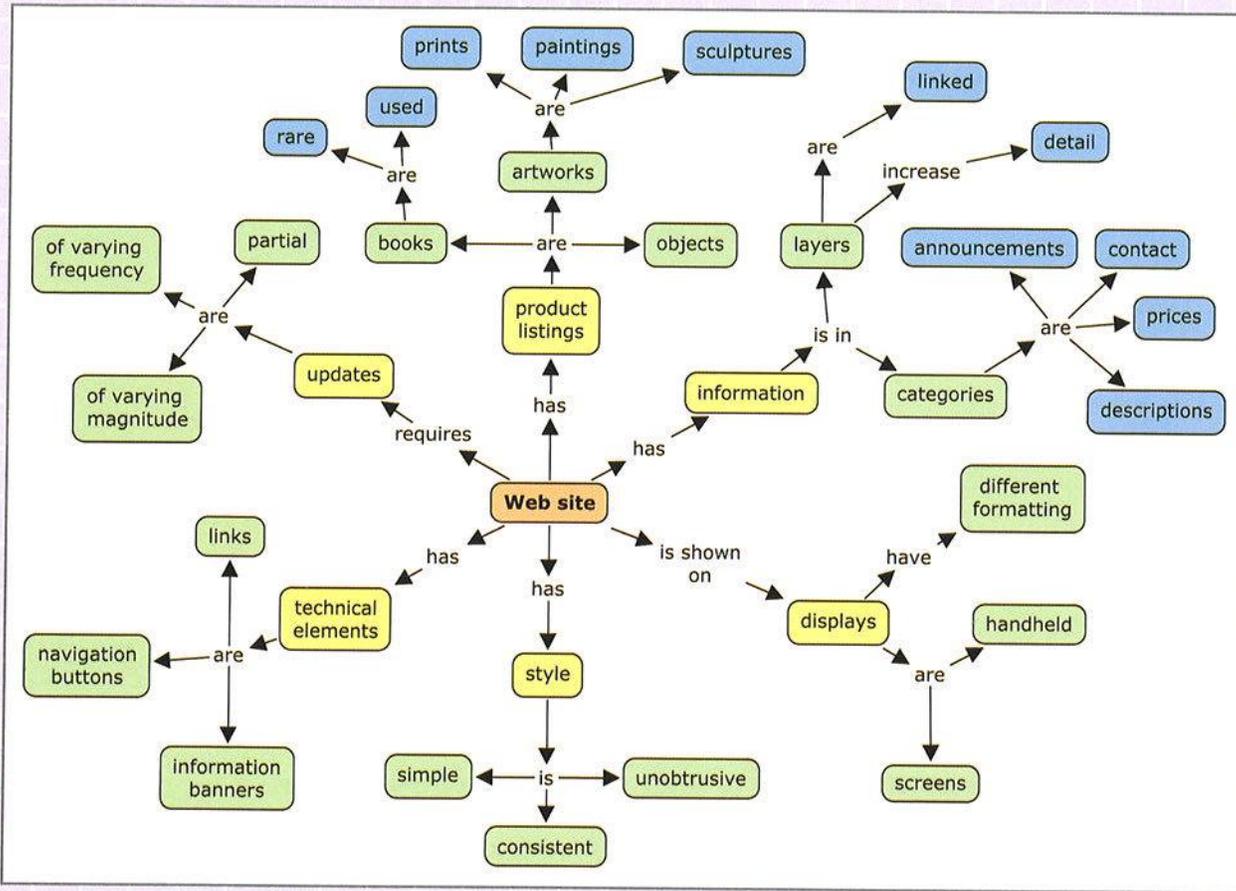
#### APPAREL: CONCEPT MAP



# FURNITURE: CONCEPT MAP



# GUI: CONCEPT MAP



## 1: BRAINSTORM

**1.1: Apply the brainstorming and analysis techniques to your idea. Then rewrite your design thesis to accommodate what you have learned.**

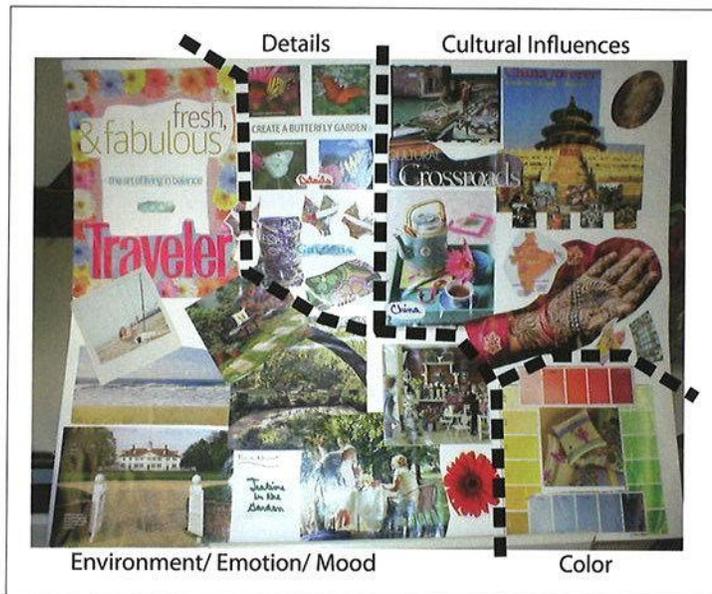
**1.2: Use concept mapping or webbing to examine your concept. Consider as many of the constraints related to the list below as possible and add others if necessary. Where you can't think of constraints that appear inherently, make one or two up, then see what happens. For example, if a color scheme is not inherently required, make one up, then see . . .**

- Form
- Function
- Materials
- Texture
- Color
- Fabrication
- Sustainability

**1.3: List the pros and cons of the design solutions you have outlined.**

**1.4: Apply the SCAMPER method to your concept, and make note of any new insights (positive and negative).**

## 2: CONCEPT BOARD



**Figure 3.24** Remember that the concept board is ultimately information. Make sure that the artistry allows for the message to come through. Group images and add text to make things as clear as possible. Without clarity all your efforts are wasted.

Assemble downloaded images, newspaper pictures, magazine pages, samples of materials, sketches, and any other visual to illustrate the results of Exercise 1. Create a collage on a presentation board, either on a physical board or in photo-editing software. Add text as necessary to explain the concept you have created.

Follow these guidelines for creating concept boards:

- Assemble all your materials before you begin.
- Lay them out on a table, or on your computer screen, and rearrange them a few times until you have found a good layout.
- Find any images that you now see are missing or needed.
- Put it together.

A good layout does the following:

- Groups together images and samples that explain one particular element of the design
- Uses text primarily to work with and back up images
- Does not rely on an oral presentation to be understood
- Can be viewed and read with relative ease from a distance of 10 to 12 feet, if on a physical board, across a deck if on a computer, or from across a room if on a projector screen.
- Is controlled by an aesthetic that corresponds to the design concept in question. Think of your design's "look," and consider whether your board can reflect that. In the least, make sure your board does at least not contradict the direction of your design's aesthetic.

If working in physical material, rather than digital, it is a good idea to get used to standard presentation-board sizes and begin to become accustomed to what you can fit into that format. Anything too large for the mode of transportation you are using (larger than the back seat of an average car) is clearly not a good idea. Consider also that anything smaller than 11" × 17" becomes tricky if you are relying on images from magazines and newspapers because your board will get filled up very quickly. Conversely, digital media is changing constantly in terms of screen sizes and software. Keep an eye on what's available and be very aware of the possibility that your work may be viewed on any size of screen.

- 1 Linda Tain, *Portfolio Presentations for Fashion Designers*, 2nd ed., (New York: Fairchild Publications, Inc., 2004). For more information, also see Mark Oldach, *Creativity for Graphic Designers: A Real-World Guide to Idea Generation—from Defining Your Message to Selecting the Best Idea for Your Printed Piece* (Cincinnati, OH: North Light Books, F&W Publications, Inc., 2000).
- 2 Billy Collins, “Budapest,” *Sailing Alone Around the Room* (New York: Random House, 2001).
- 3 Robert Kunzig, “Curing Congestion—Traffic Congestion,” *Discover Magazine*, 1999.
- 4 Joseph D. Novak, *The Theory Underlying Concept Maps and How to Construct Them*. Cornell University, <http://cmap.ihmc.us/publications/researchpapers/theorycmaps/theoryunderlyingconceptmaps.htm> (Accessed March 2014).
- 5 <http://cmap.ihmc.us/> (Accessed March 2014).