New Knowledge

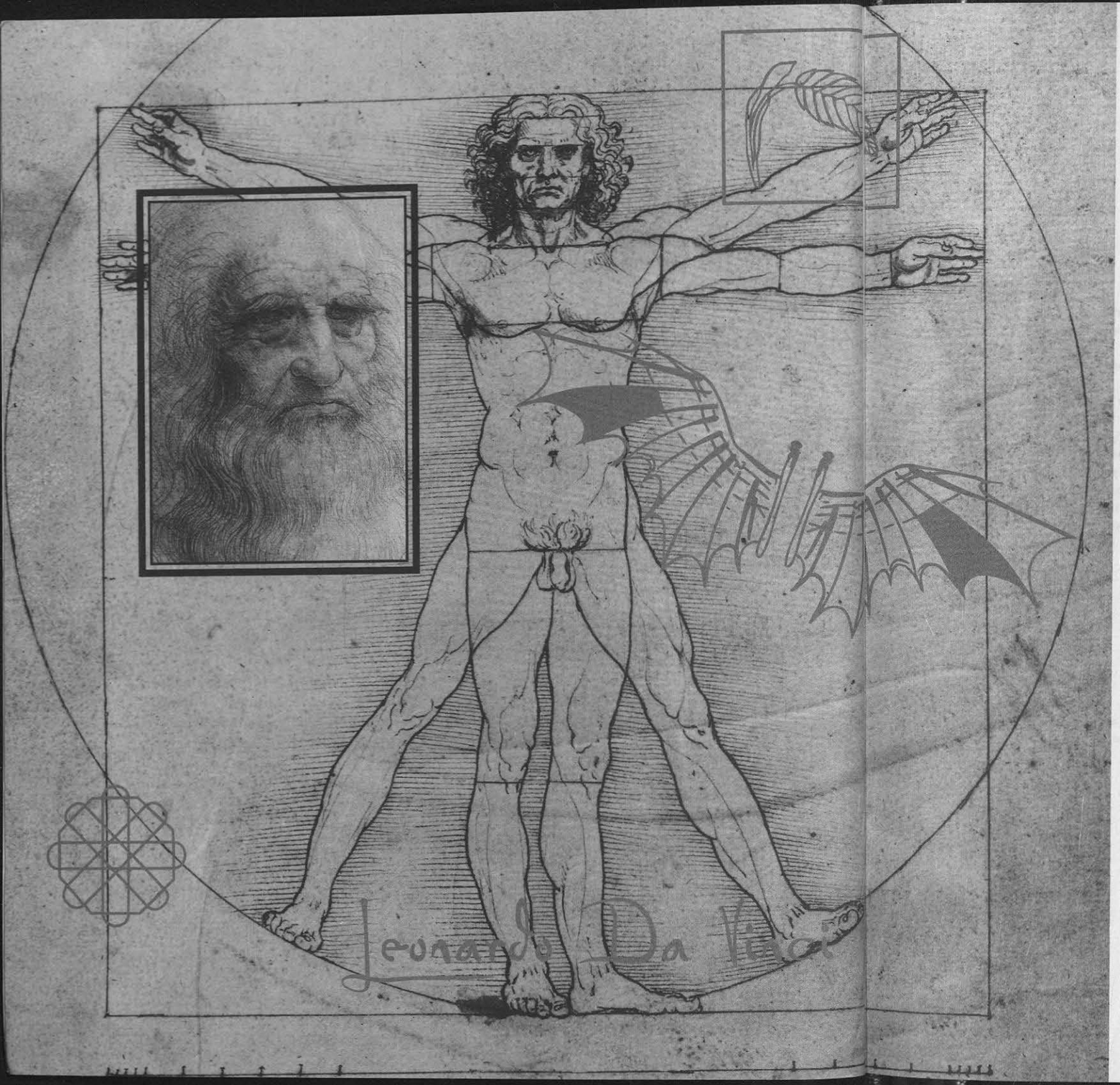
Points of Personal Connection

SELECTED READING MATERIAL

Your Name

Questions/Disagreements

Areas for Further Study

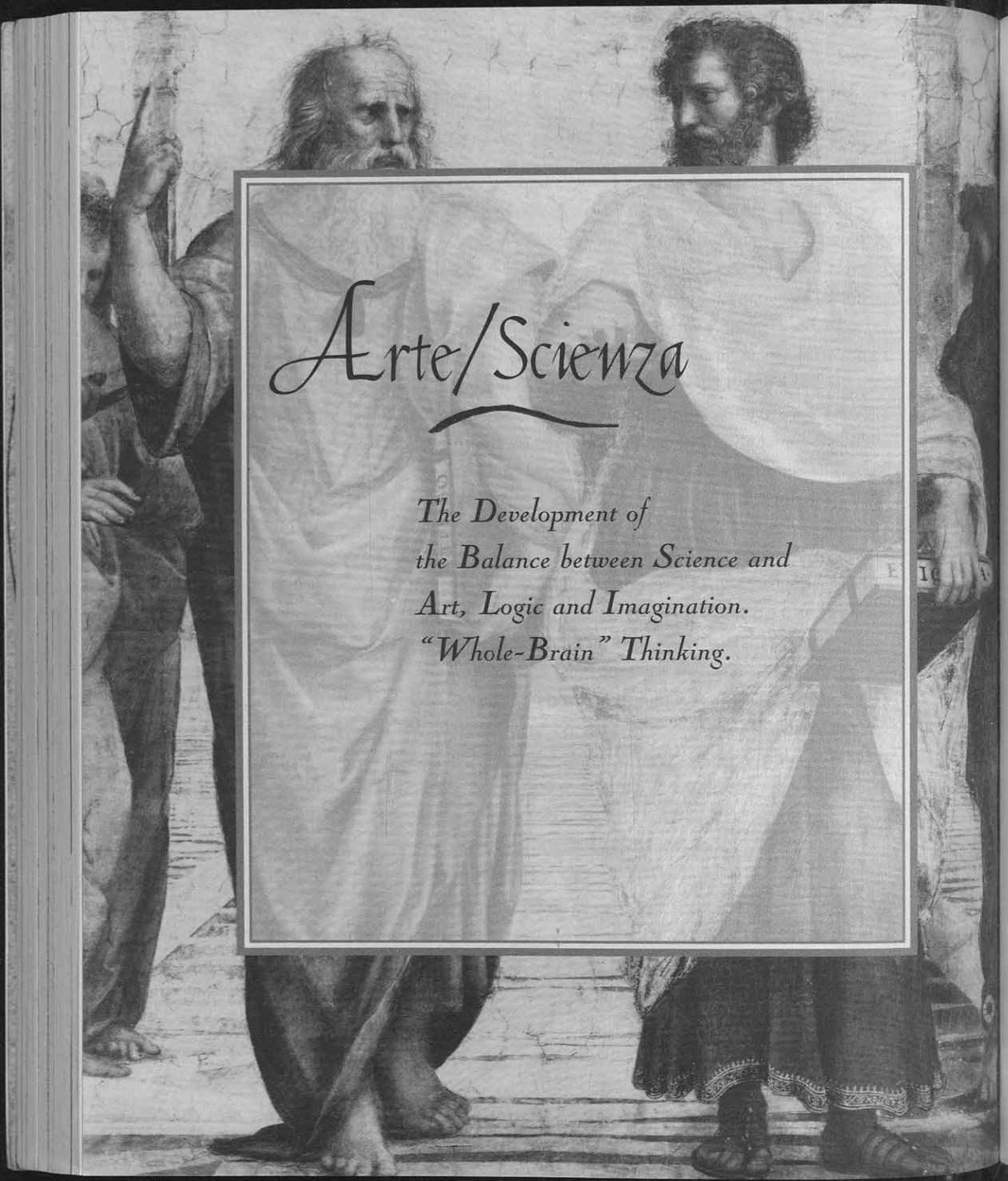


How to Think like *Leonardo da Vinci*

SEVEN STEPS TO GENIUS EVERY DAY

MICHAEL J. GELB

DELTA TRADE PAPERBACKS



Arte/Scienza

The Development of the Balance between Science and Art, Logic and Imagination. "Whole-Brain" Thinking.

Are you familiar with the research into the left and right hemispheres of the cerebral cortex? If so, do you know your "brain-dominance profile"? In other words, are you a more artistic, intuitive, right-hemisphere thinker? Or do you feel more comfortable with the step-by-step logic of the left?

The terms *left-brained* and *right-brained* came into popular parlance through the Nobel prize–winning research of Professor Roger Sperry. Sperry discovered that in most cases, the left hemisphere of the cerebral cortex processes logical, analytical thinking while the right hemisphere processes imaginative, big-picture thinking.

Although our schools often pay lip service to the idea of the balanced Renaissance individual, in practice we suffer from a pandemic of "half-witted" thinking. In the words of Professor Sperry, "Our education system, as well as science in general, tends to neglect the non-verbal form of intellect. What it comes down to is that modern society discriminates against the right hemisphere." The result is that individuals with left-hemisphere dominance tend to do well in school but often fail to develop their creative capacities, while individuals who are right-hemisphere dominant often feel guilty for the way they think and are frequently mislabeled as "learning disabled."

Seekers of balance are inevitably drawn to a study of Leonardo. A significant part of our fascination with him is his stature as the supreme "whole-brain" thinker.

Art historian Kenneth Clark begins his essay on the relationship between Leonardo's science and art by emphasizing the interdependence of the disciplines: "It is usual to treat Leonardo as a scientist and Leonardo as a painter in separate studies. And no doubt the difficulties in following his mechanical and scientific investigations make this a prudent course. Nevertheless, it is not completely satisfactory, because in the end the history of art cannot be properly understood without some reference to the history

of science. In both we are studying the symbols by which man affirms his mental scheme, and these symbols, be they pictorial or mathematical, a fable or a formula, will reflect the same changes." Historian of science George Sarton reflects from a different perspective but reaches similar conclusions: "Since the growth of knowledge is the core of progress, the history of science ought to be the core of general history. Yet the main problems of life cannot be solved by men of science alone, or by artists and humanists: we need the cooperation of them all. Science is always indispensable but never sufficient. We are hungry for beauty, and where charity is lacking nothing else is of any avail." Sarton adds, "[Leonardo's] outstanding merit is to have shown by his own example that the pursuit of beauty and the pursuit of truth are not incompatible."

So, was Leonardo a scientist who studied art, or an artist who studied science? Clearly, he was both. His scientific studies of rocks, plants, flight, flowing water, and human anatomy, for example, are expressed in beautiful, evocative, expressive works of art, not dry technical drawings. At the same time, the plans for his paintings and sculptures are exquisitely detailed, painstakingly analytical, and mathematically precise.

As Jacob Bronowski, author of *The Ascent of Man,* comments, "[Leonardo] . . . took an artist's vision into science. He understood that science, as much as painting, has to find the design of nature in her detail . . . he gave science what is most needed, the artist's sense that the detail of nature is significant. Until science had this sense, no one could care—or could think that it mattered—how fast two unequal masses fall and whether the orbits of planets are accurately circles or ellipses."

For Leonardo, art and science were indivisible. In his *Treatise on Painting* he cautions potential adepts: "Those who become enamoured of the art, without having previously applied to the diligent study of the scientific part of it, may be compared to mariners who put to sea in a ship without rudder or compass and therefore cannot be certain of arriving at the wished for port."

Leonardo emphasized, for example, that the ability of the artist to express the beauty of the human form is predicated on a profound study of

the science of anatomy. Lacking an appreciation born of a detailed analysis of bone structure and muscular relationships, the would-be artist was liable to draw "wooden and graceless nudes that seem rather as if you were looking at a stack of nuts than a human form, or a bundle of radishes rather than the muscles. . . ." He also noted, "Be sure you know the structure of all you wish to depict." Yet Kenneth Clark contends that Leonardo's science was predicated on his art: "It is often said that Leonardo drew so well because he knew about things; it is truer to say that he knew about things because he drew so well."

While championing rigor (one of his mottoes was *"Ostinate rigore!"*—Obstinate rigor!), attention to detail, logic, mathematics, and intense practical analysis, Leonardo also urged his students to awaken the power of

Map of Imola *by Leonardo da Vinci. Leonardo's ability to see the whole picture and the details allowed him to make remarkably accurate maps.*

The Role of the Artist in Leonardo's Time

At the time of Leonardo's birth, the artist was an anonymous craftsman with the social staus of a laborer. Artists worked in a setting more like a factory than a modern studio and were paid wages by the hour. Most of their products were collaborative efforts that remained unsigned. In pre-Renaissance Europe, all creativity was vested in the divine and the idea of human as creator was blasphemous.

In the course of Leonardo's lifetime, the artist's role transformed dramatically. Artists began to undertake work based on their own interests rather than the specific dictates of a patron. They began to sign their paintings and to write autobiographies, and biographies were written about them. Raphael, Titian, and Michelangelo became superstars in their own time, wealthy, respected, venerated.

The seeds of this remarkable transformation were planted by Leonardo's precursor, Leon Battista Alberti, in whose day arithmetic, geometry, astronomy, music, grammar, logic, and rhetoric were accepted, among the intellectual elite, as the noble disciplines, the foundations of knowledge. Painting was not included, but Alberti saw that the emerging mathematically based disciplines of proportion and perspective could provide the common ground for painting and the noble disciplines. Leonardo seized this idea and extended it. His formulation of painting as a science placed his beloved practice of "knowing how to see" first among the liberal arts. Da Vinci's urgings to "go straight to nature," to be an original, what he called an *"inventore,"* served to transform not only the role of the artist but the very concept of genius.

imagination in what was, then, an unprecedented way. Offering what he called "a new and speculative idea, which although it may seem trivial and almost laughable, is none the less of great value in quickening the spirit of invention," he urged students to stare at stones, smoke, embers, clouds, and mud, and cultivate their ability to see in these mundane forms "the likeness of divine landscapes . . . and an infinity of things." Such insight, he writes, "comes about as it does with the sound of bells, in whose clanging you may discover every name and word that you can imagine."

"Study the science of art and the art of science."
—Leonardo da Vinci

This instruction represents more than just advice to stimulate an artist's imagination; it is a breakthrough in the evolution of human thought. Da Vinci gave birth to a tradition that resulted in the modern discipline of "brainstorming." Prior to Da Vinci the concept of "creative thinking" as an intellectual discipline didn't exist.

ARTE/SCIENZA AND YOU

While all the principles in this book can help you balance your hemispheres and awaken your latent Da Vincian capabilities, you can concentrate on that balance by using one simple, tremendously powerful method for cultivating a synergy between Arte and Scienza in your everyday thinking, planning, and problem solving. The method is called mind mapping.

Mind mapping is a whole-brain method for generating and organizing ideas, originated by Tony Buzan, and largely inspired by Da Vinci's approach to note taking. You can use mind mapping for personal goal setting, daily planning, and interpersonal problem solving. It can help you at work, with your kids, or with any pursuit. The most marvelous application of mind mapping, however, is that through regular practice it trains you to be a more balanced thinker, à la Leonardo.

Arte/Scienza at Work

Ned Hermann, founder of the Whole Brain Corporation, developed a test to determine hemispheric dominance. In his workshops, Hermann has been known to take those who test out as "ultra-left" and "ultra-right," and give them a special assignment. They are allowed two hours to complete it. The ultra-left-brained group returns exactly on time, having completed a typewritten report, with all the i's dotted and t's crossed. Beautifully organized, their report is painfully boring and uninspired. The ultra-right-hemisphere group involves itself in a philosophical debate on the meaning of the assignment. They return at different times with ideas scratched on scrap paper, disorganized and generally useless.

The two groups are then combined into one, with a facilitator guiding them as they work together on another task. They return on time with a balanced, organized, creative product. The lesson: Effectiveness demands the creation of balanced brain teams.

More often than not, however, individuals tend to polarize by hemispheric style. The left-brain dominants in the finance department gather by their coffee machine, look over at the right-brained marketing people, and think, "Those flaky dreamers have their heads in the clouds. They don't understand the bottom line like we do." Meanwhile, at the right-brained watercooler, the right-brainers are eyeing the left-brainers and thinking, "What tiny minds those bean counters have. They don't see the whole picture like we do."

Individuals often fall into a similar trap internally. Left-brainers think, "I'm sorry, I'm left-brained. I can't possibly be creative or imaginative." And right-brainers make the mistake of programming themselves: "Well, I'm right-brained—I can't possibly come to meetings on time."

Since 1978 I've worked with thousands of managers at all levels. Some are analytical, serious, thorough planners; others are intuitive, playful, spontaneous improvisers. The very best are those who balance analysis and intuition, seriousness and play, planning and improvisation, Arte and Scienza.

Let's set the stage for learning to mind map by considering the method that most of us learned for generating and organizing ideas: the outline. The traditional outline begins with "Roman numeral I." Have you ever spent an inordinate amount of time waiting for idea Roman numeral I? Perhaps you finally get it after twenty minutes or so and continue your outline down to point IIId, when you realize that point IIId should be point IIb. You cross it out and draw an arrow. Now your outline is getting messy. And we all know that outlines must be *neat*. Frustrated, you start to doodle or daydream. Your repressed "right hemisphere" is attempting to express itself, but doodling makes your outline even messier, and you feel guilty for daydreaming. Beset and beleaguered by this internecine cortical strife, you crumple up your paper and try to begin again.

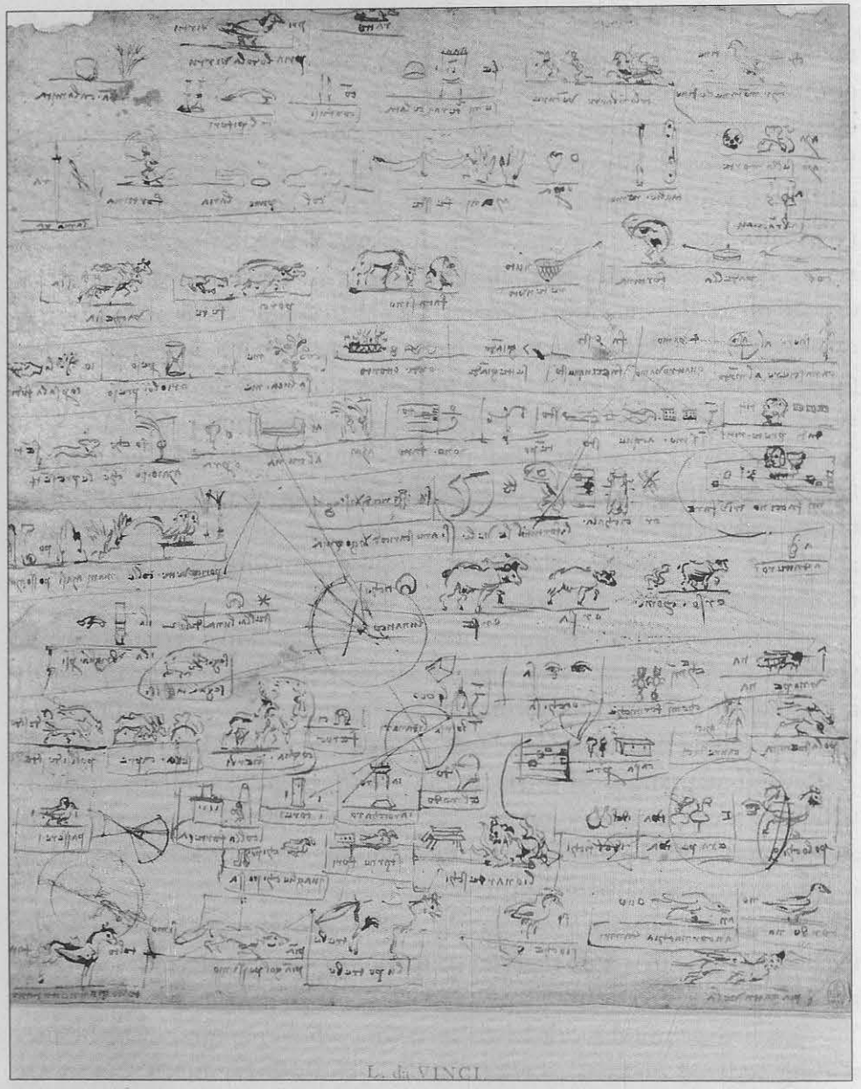
Although valuable as a tool for presenting ideas in a formal, orderly fashion, *outlining is useful only after the real thinking has been done.* If you try to generate your ideas by outlining, you will find that it slows you down and stifles your freedom of thought. It is just plain illogical to try to organize your ideas before you've generated them.

Moreover, outlining and other linear note-making systems exclude your brain's capacity for color, dimension, synthesis, rhythm, and image. By imposing one color and one form, outlining guarantees monotony. Outlining uses only half of your mind, and half a mind is a terrible thing to waste.

Mind mapping frees you from the tyranny of premature organization, which stifles your generation of ideas. Mind mapping liberates your conceptual powers by balancing generation and organization while encouraging the full range of mental expression.

Think about the last book you read or the last seminar you attended. Imagine that you have to write a report on that book or seminar. Begin recalling the information. As you do, observe the process of your mind at work.

Does your mind work by constructing whole paragraphs or by presenting ordered outlines to your mind's eye? Probably not. Chances are that impressions, key words, and images float into mind, one associating with the next. Mind mapping is a method for continuing this natural thinking process on paper.



Pages like this one from Leonardo's notebooks helped inspire the creation of modern mind mapping.

The metaphor of left and right hemispheres of the cerebral cortex.

Leonardo urged artists and scientists to "go straight to nature" in the search for knowledge and understanding. If you contemplate the structure of a tree or a plant like the star-of-Bethlehem, you can see that it is a network of life, expanding in all directions from its trunk or stem. Take a helicopter ride over a major city; it is a sprawling structure of interconnecting centers and pathways, main arteries connecting with side roads. Our water table, global telecommunication system, and solar system are similarly linked networks. The structure of communication in nature is nonlinear and self-organizing; it works through networks and systems.

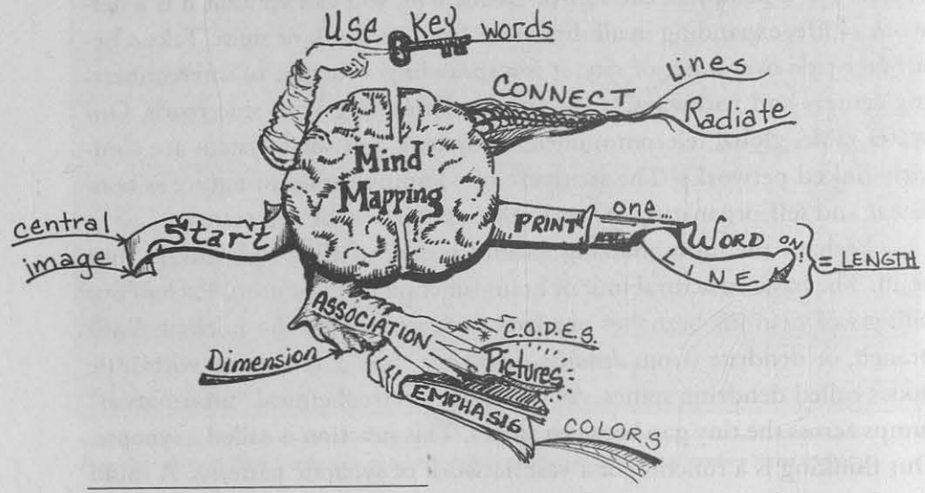
Perhaps the most amazing natural system of all is right inside your skull. The basic structural unit of brain function is the neuron. Each of our billions of neurons branches out from a center, called the nucleus. Each branch, or dendrite (from *dendron*, meaning "tree"), is covered with little nodes called dendritic spines. As we think, electrochemical "information" jumps across the tiny gap between spines. This junction is called a synapse. Our thinking is a function of a vast network of synaptic patterns. A mind map is a graphic expression of these natural patterns of the brain.

It should not be too surprising, therefore, that the note-taking styles of many of history's great brains—such as Charles Darwin, Michelangelo, Mark Twain, and of course, Leonardo da Vinci—feature a branching, organic structure complemented by lots of sketches, creative doodles, and key words.

How right- or left-brained are you? Before you set out to learn to mind map your way to whole-brain thinking, turn the page and spend a few minutes reflecting on your own "hemispheric proclivities." Which statements apply to you?

Which list on the opposite page describes you best? The first list is a classic description of someone who is more left-brained. The second list contains characteristics associated with a more right-brained person. Of course, most people are more complex than this simple model suggests. Nevertheless, the metaphor of left and right is a useful tool for thinking about balance.

Whatever your hemispheric tendencies happen to be, the key to fulfilling your full potential is the continuing discovery of balance.



Mind Map on the Rules of Mind Mapping

Arte/Scienza: Self-Assessment

- ❑ I like details.
- ❑ I am almost always on time.
- ❑ I am skilled at math.
- ❑ I rely on logic.
- ❑ I write clearly.
- ❑ Friends describe me as very articulate.
- ❑ Analysis is one of my strengths.
- ❑ I am organized and disciplined.
- ❑ I like lists.
- ❑ I read a book starting at page one and go through in order.

- ❑ I am highly imaginative.
- ❑ I am good at brainstorming.
- ❑ I often say or do the unexpected.
- ❑ I love to doodle.
- ❑ In school I was better at geometry than algebra.
- ❑ I read a book by skipping around.
- ❑ I prefer to look at the big picture and leave the details to someone else.
- ❑ I often lose track of time.
- ❑ I rely on intuition.

Arte/Scienza: Applications and Exercises

Learn the Rules of Mind Mapping

At the end of the *Treatise on Painting,* Leonardo wrote, "These rules are intended to help you to a free and good judgement: for good judgement proceeds from good understanding, and good understanding comes from reason trained by good rules, and good rules are the children of sound experience, which is the common mother of all the sciences and arts."

The rules of mind mapping are "intended to help you to a free and good judgement." They are "the children of sound experience," having been extensively tested and refined over the past thirty years.

All you need to begin mind mapping is a topic, a few colored pens, and a large sheet of paper. Follow these rules:

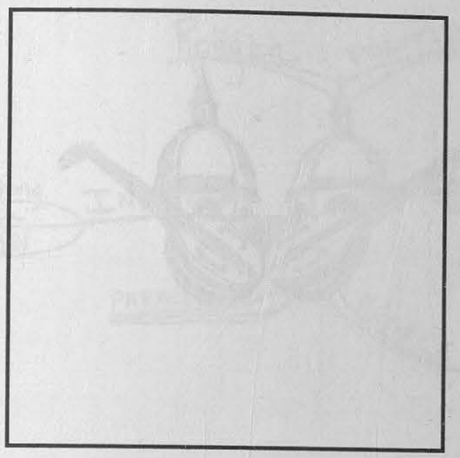
1) Begin your mind map with a *symbol* or a *picture* (representing your topic) at the *center* of your page.
   Starting at the center opens your mind to a full 360 degrees of association. Pictures and symbols are much easier to remember than words and enhance your ability to think creatively about your subject.

2) Write down key words.
   Key words are the information-rich "nuggets" of recall and creative association.
3) Connect the key words with lines radiating from your central image.
   By linking words with lines ("branches"), you'll show clearly how one key word relates to another.
4) Print your key words.
   Printing is easier to read and remember than writing.
5) Print *one* key word per line.
   By doing this, you free yourself to discover the maximum number of creative associations for each key word. The discipline of one word per line also trains you to focus on the most appropriate key word, enhancing the precision of your thought and minimizing clutter.
6) Print your key words *on* the lines and make the length of the word the same as the line it is on.
   This maximizes clarity of association and encourages economy of space.
7) Use colors, pictures, dimension, and codes for greater association and emphasis.
   Highlight important points and illustrate relationships between different branches of your mind map. You might, for instance, prioritize your main points through color coding, highlighting in yellow the most important points, using blue for secondary points, and so forth. Pictures and images, preferably in vivid color, should be used wherever possible; they stimulate your creative association and greatly enhance your memory.

Make Your Own Mind Map

As you experiment with mind mapping, its advantages will become increasingly obvious. Mind mapping allows you to start quickly and generate more ideas in less time; you'll find that thinking, working, and problem solving become a lot more fun. All outlines tend to look the same, but every mind map is different. Perhaps the greatest advantage of mind mapping is that by nurturing your unique, individual self-expression it guides you to discover your own originality. Regular practice of mind mapping will help you become an *"inventore."*

This simple mind-mapping exercise will help you get started:



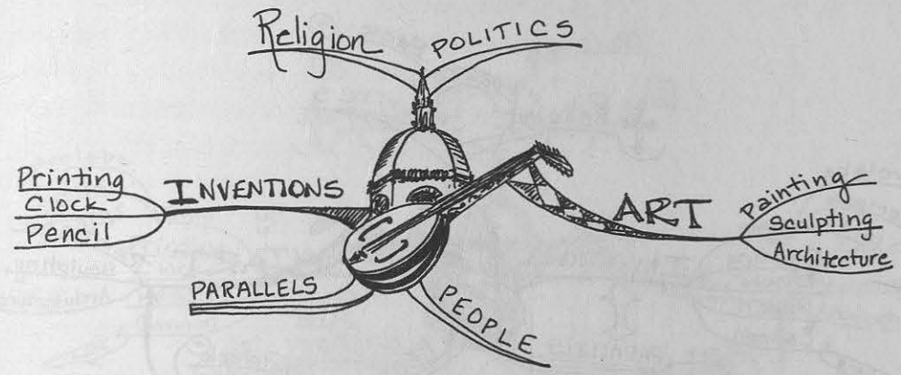
1) Begin with a large sheet of blank white paper and six or more colored pens. You may want to use phosphorescent highlighters for extra color. Of course, one pen or pencil and a small sheet of paper will work in a pinch.

Although you can make mind maps on the backs of matchbooks, in the palm of your hand, or on Post-it notes, it's best to use a big sheet of paper; flip-chart size is recommended. The bigger the paper, the greater the freedom to express your associations.

Place the paper horizontally in front of you. A horizontal disposition makes it easier for you to keep all your key words upright and easy to read.

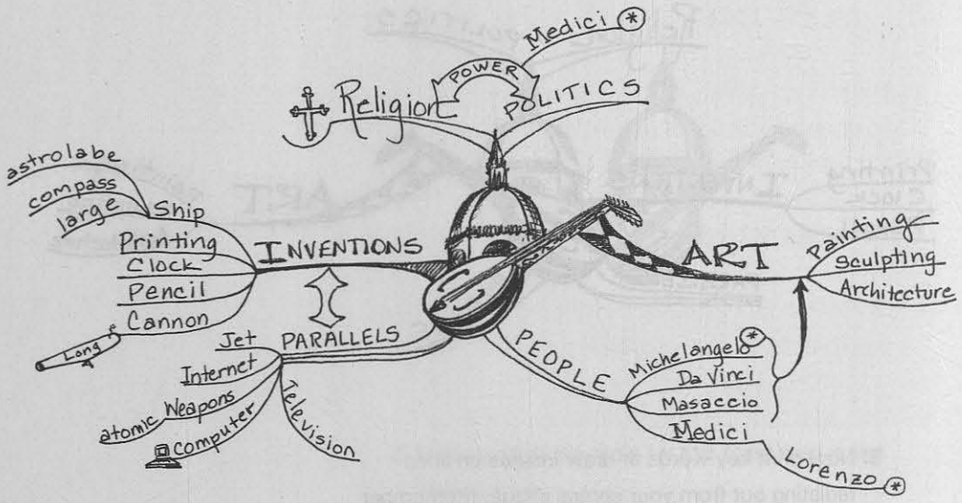
2) Let's say that the topic for this mind map is the Renaissance.

- Start your mind map by drawing a representative image in the middle of the paper.
- Draw it as vividly as you can, using more than one color.
- Have fun and don't worry about the accuracy of your drawing.



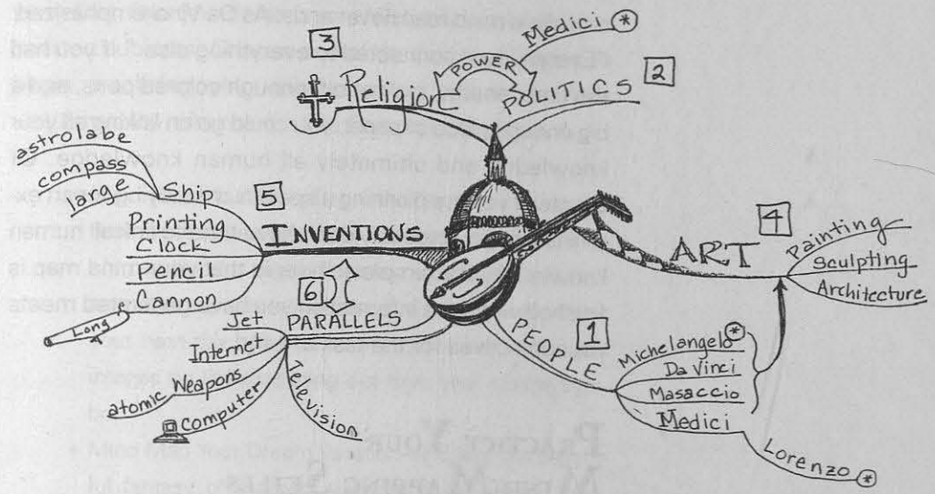
3) Now print key words or draw images on lines radiating out from your central image. (Remember to print *on* the lines, *one* key word or image per line, and keep the lines connected.)

- Generating ideas in key-word form is easy. For example, as you think about the Renaissance, one key word might be *art,* which might trigger other key-word associations, like *painting, sculpture, architecture.* Another key branch could be *inventions,* triggering associations such as *printing, clock, pencil.* Other main branches might include *people, politics, religion, parallels.*
- If you feel stuck, choose any key word on your mind map and immediately print your first association with that word—even if it seems ridiculous or irrelevant. Keep your associations flowing and don't worry about making sure that every word is "right."



4) When you feel you have generated enough material through free association, look at the result: all your ideas spread across one page.

- As you examine your mind map, you will see relationships that help you organize and integrate your ideas.
- Look for words that appear repeatedly throughout the map. They often suggest major themes.



5) Connect related parts of your mind map with arrows, codes, and colors.

- Eliminate elements that seem extraneous. Pare your mind map down to just the ideas you need for your purpose.
- Then put them in sequence, if necessary. This can be accomplished with numbers or by redrawing the mind map in clockwise order.

How do you know that your mind map is finished? Theoretically, a mind map never ends. As Da Vinci emphasized, "Everything is connected to everything else." If you had the time, energy, inclination, enough colored pens, and a big enough piece of paper, you could go on linking all your knowledge and ultimately all human knowledge. Of course, if you are planning a speech or studying for an examination, you probably don't have time to link all human knowledge. The simple answer is that your mind map is finished when the information you have generated meets your objectives for the task at hand.

Practice Your Mind-Mapping Skills

Although mind mapping is an invaluable tool for simplifying complex tasks such as strategic planning, presentation preparation, meeting management, test preparation, and systems analysis, it is probably best to make your first few mind maps on relatively simple, lighthearted subjects. Choose one of the following topics to begin practicing your mind-mapping skill, solo. Take about twenty minutes for this first practice map.

- Mind Map Your Next Day Off—Begin with a simple drawing that represents a free day (e.g., a smiling sun, a calendar page). Print key words and draw images that express some things you might like to do on your next day off. Remember to put key words and images on lines radiating out from your central symbol.
- Mind Map Your Dream Vacation—Explore the delightful fantasy of a dream vacation using a mind map. Start with a symbol of your paradise in the center (e.g., ocean waves, snow-covered mountains, the Eiffel Tower), and then branch out with key words and images that represent the elements of your ideal holiday.
- Mind Map a Perfect Evening for a Friend—Use a mind map to explore the design of a perfect evening for someone you love. Start with an image in the center that represents your friend. Then, using key words or images, branch out with all your thoughts for your friend's happiness. Remember, let your mind work by association instead of trying to put things down in order. Just generate ideas for your friend's delight. Then after you have come up with a multitude of possibilities, you can go back and put them in order.

Some tips for keeping your mind map neat, easy, and organized. Keep your central image in the center of the page and limit its size. Use angled and curved lines as necessary to keep all your key words upright and easy to read. Use just one word per line and be sure to *print* the key words. Make the lines a bit thicker at their origin and print your letters at least one-quarter inch in height so they are easy to read. You can print some letters even larger for emphasis. Make each word the same size as the line underneath it. This saves space and allows you to see connections more clearly. If possible, use large sheets of paper. This helps to avoid crowding and encourages you to think big. Do not be concerned if your first draft seems disorganized. You can make a second or third draft for further clarification.

Review your mind map of your day off, dream vacation, or perfect evening. Check your mind map to see how well you followed the rules:

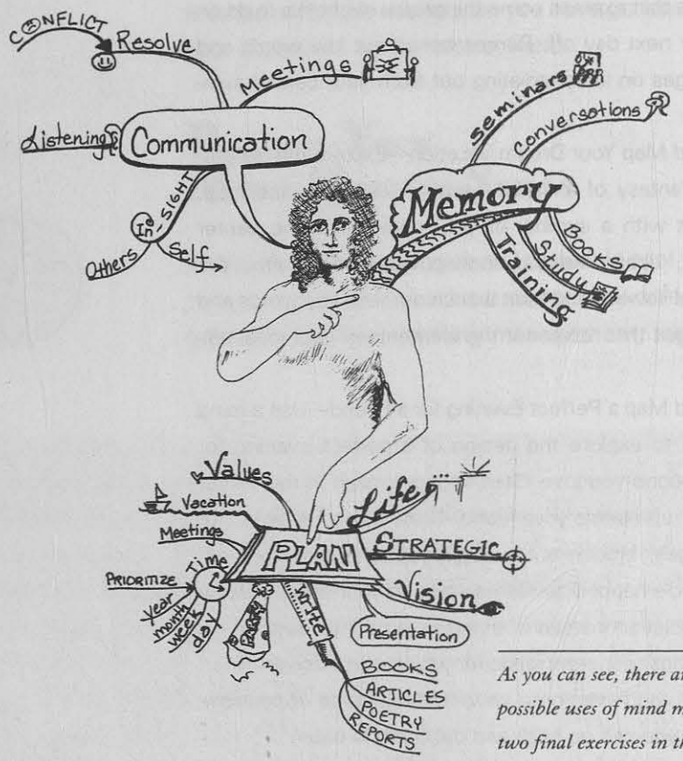
—Did you create vivid, multicolored images?

—Did you remember to use just *one* word per line?

—Did you print your key words?

—Did you keep your lines connected?

If you departed from the rules, redo your map correctly.



As you can see, there are many possible uses of mind mapping. The two final exercises in this chapter guide you to use this thinking tool in ways that are particularly inspired by the maestro.

Make a Mind-mapping Mind Map

Okay, now that you are warmed up, try making a mind map on all possible uses of mind mapping. Start with an image in the center of the page that represents the concept of mind mapping for you. Then branch out, putting printed key words or images on connected lines. Aim to generate at least twenty *specific* possible applications of mind mapping in your personal and professional life. After you have completed your mind map, highlight what you think might be the most valuable applications. Then look at the Applications Map on the previous page for some of the most popular uses of mind mapping.

Make a Memory Mind Map

Leonardo's incredible ability to learn and create was predicated on his cultivation of memory, what he called "learning by heart." After careful observation from multiple perspectives, Leonardo drew a visual image of his subject. Then, late at night or early in the morning, as he lay in bed, he would review and vivify the image in his mind's eye. Then he compared his mental image to his best drawing until he could hold the perfect image in his mind.

Mind mapping is a tremendously powerful tool for learning things by heart. Try the following exercise,

based on Leonardo's method, for committing something to memory:

- Think of something you would like to remember—perhaps the content of a book you particularly enjoy; a presentation you plan to give; or all the material for a final exam at school or in college.
- Make a comprehensive mind map of your subject, emphasizing vivid images of your most important points. You may, depending on the volume and complexity of your material, need to do multiple drafts to organize, integrate, and clearly express your subject.
- When you complete your "master mind map," put it aside. Take a blank sheet of paper and, without referring back to the original, attempt to re-create your master map from memory. Do this until you can re-create your original in detail.
- When you are resting in bed, picture your master map in your mind's eye. Practice visualizing until your mental image matches your master map.
- Now give your presentation or take your test with *perfect recall* of your material.

Make a Creativity Mind Map

Mind mapping is a wonderful tool for awakening your creativity and, in Leonardo's words, "quickening the spirit of invention." Think of an idea you would like to explore, or a question or challenge that requires some fresh thinking. Get a large sheet of blank paper and in the center draw an abstract image of your topic. Now,

Arte/Scienza for Parents

Many of my clients and friends with more than one child report that their kids have different brain "styles," and that if they are not careful, they will tend to pass on the prejudices of their own dominant mode. As a "left-dominant" parent commented, "You know, I've been a fool. I have two kids; one is just like me—very good at math and figures, disciplined and focused. My other kid is totally different—a real dreamer, very artistic but all over the place. Last night I realized that I have been discriminating against my more right-brained child. If I was more open to him and encouraged him to share his way of looking at things with his brother and me, then we would all be better off."

Just as we build "balanced-brain teams" in the workplace, it is also important do so at home. Many parents unwittingly pass on their cortical prejudices to their children. Support your kids in developing the skills of Arte and Scienza together. If your child shows a preference for right-brain thinking, tackle history lessons by acting out scenes from the past. Approach mathematics by writing out theorems and equations in bold colors. Help your child be on time by making a color-coded, picture-filled calendar. If your child's orientation is more left-brained, help her to develop balance by emphasizing art, drama, and music appreciation. Whatever your child's brain dominance, she will become more balanced if you encourage her to use mind maps; focus especially on nurturing your child's ability to "learn by heart" by making memory mind maps of schoolwork.

just as the maestro suggested free-associating in response to "certain walls stained with damp or at stones of uneven color," free-associate with your abstract image, recording your associations on the branches of your map. If you let your mind go, you will, in the maestro's words, "be able to see . . . an infinity of things, which you will be able to reduce to their complete and proper forms."

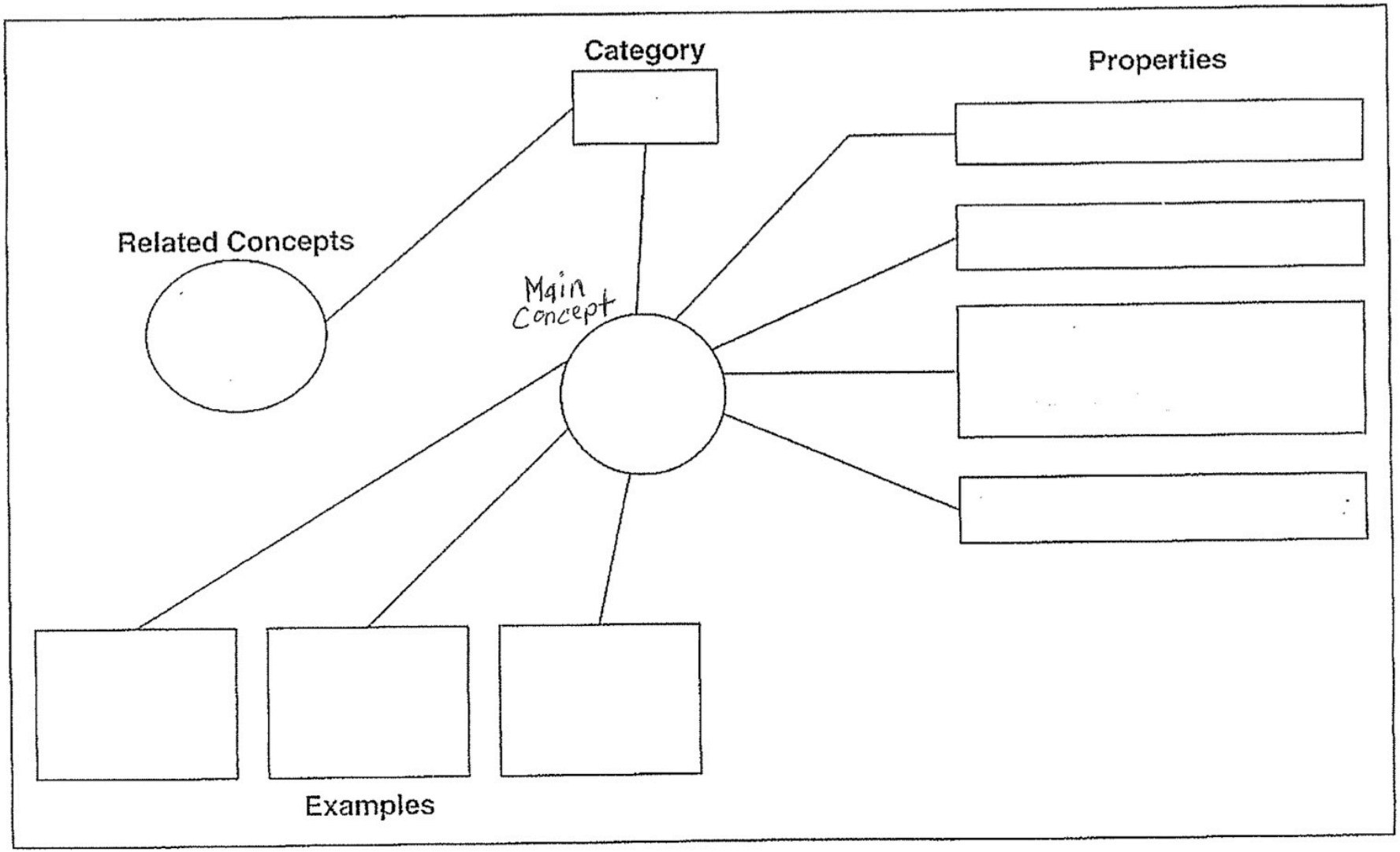
If you think of an idea that seems "off the wall," put it in your mind map and keep going. Absurd and unusual associations often lead to creative breakthroughs. Remember that even the greatest genius of all time was concerned that his "new and speculative idea . . . may seem trivial and almost laughable." But he did not let that stop him, and neither should you.

- After you have generated an abundance, if not an infinity, of associations, take a break for incubation.
- Then come back to your mind map, and generate another wave of associations.
- After another break, review the big picture of your associations, looking for connections and emerging themes.
- Next "reduce them to their complete and proper forms." In other words, pare your map down to express your most cogent insights; reorder the branches to reflect a new organization of your thoughts.

After applying the mind-map method of "learning by heart," a twelve-year-old boy from Soweto, South Africa, wrote: "Before . . . I did not think I was very smart. Now I know I have a wonderful brain. Now my school is much easier!" A manager from a Japanese computer company used mind mapping to generate ideas for a strategic plan and wrote, "Thank you very much, for finally, you wake up my brain." A chemical engineer from a Fortune 500 company used this approach to create a new patentable invention; the poet laureate of Great Britain uses it to incubate new poems. You can use it too, for strengthening your memory, balancing your brain, and "quickening your spirit of invention."

Concept Definition Map Template taken from "Concept Attainment" within The Strategic Teacher: Selecting the Right Research-Based Strategy for Every Lesson by Harvey F. Silver, Richard W. Strong, Matthew J. Perini (2009)

A Concept Definition Map .



Choose a "main concept" from "Ethical Dimensions of School-based Music Education" by Thomas A. Regelski that you have brand-new or early developing knowledge in for the concept map above. Fill out this diagram as many times as you need to with newly selected main concepts for development.

Concept Definition Map description modified from "Concept Attainment" within The Strategic Teacher: Selecting the Right Research-Based Strategy for Every Lesson by Harvey F. Silver, Richard W. Strong, Matthew J. Perini (2009)

Category: Select one of the main concepts from “Ethical Dimensions of School-based Music Education” by Thomas A. Regelski. What larger framework is your selected main concept part of?

Properties: What are the most important pieces of information that explain this main concept?

Examples: What are the important examples of this main concept?

Related Concept(s): Are there other concepts you can compare to your selected main concept?