

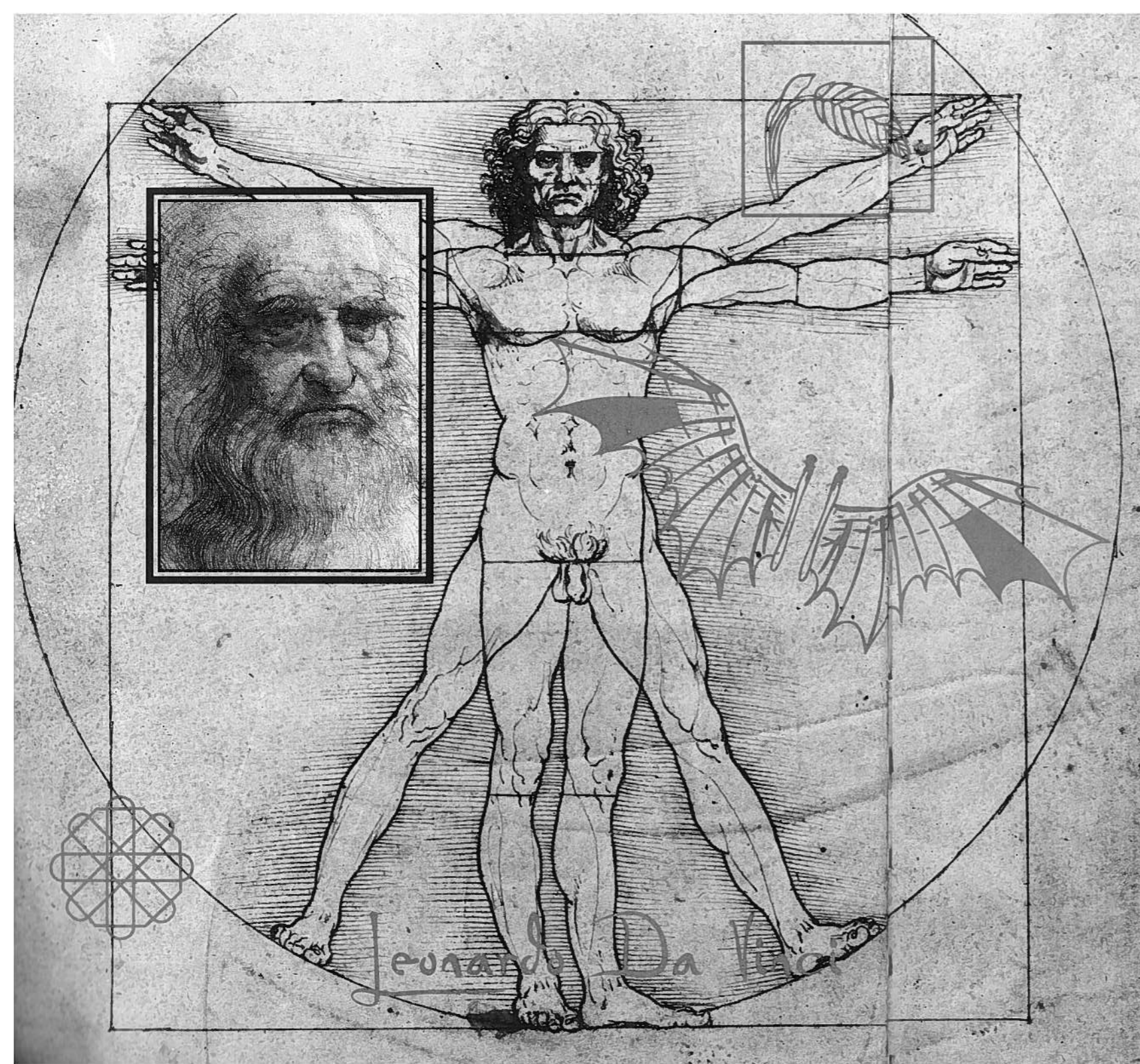
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**How**  
to  
**Think** like  
*Leonardo da Vinci*

SEVEN STEPS TO GENIUS EVERY DAY

**MICHAEL J. GELB**

DELACORTE PRESS



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*This book is dedicated to  
the Da Vincian spirit manifested in  
the life and work of Charles Dent.*



# 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.

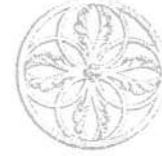
By doing this, you free yourself to discover the maximum number of creative associations for each key word. The discipline of one word per line also trains you to focus on the most appropriate key word, enhancing the precision of your thought and minimizing clutter.

- 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.

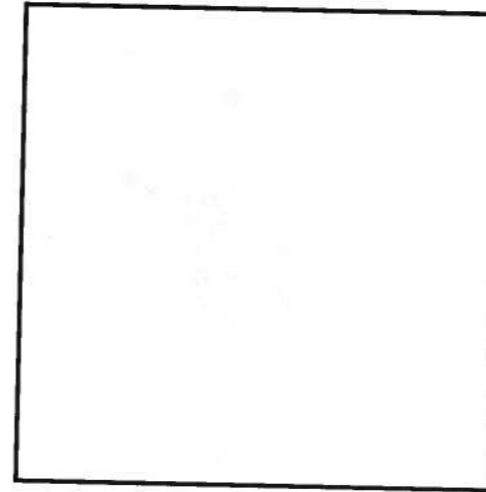
Highlight important points and illustrate relationships between different branches of your mind map. You might, for instance, prioritize your main points through color coding, highlighting in yellow the most important points, using blue for secondary points, and so forth. Pictures and images, preferably 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.

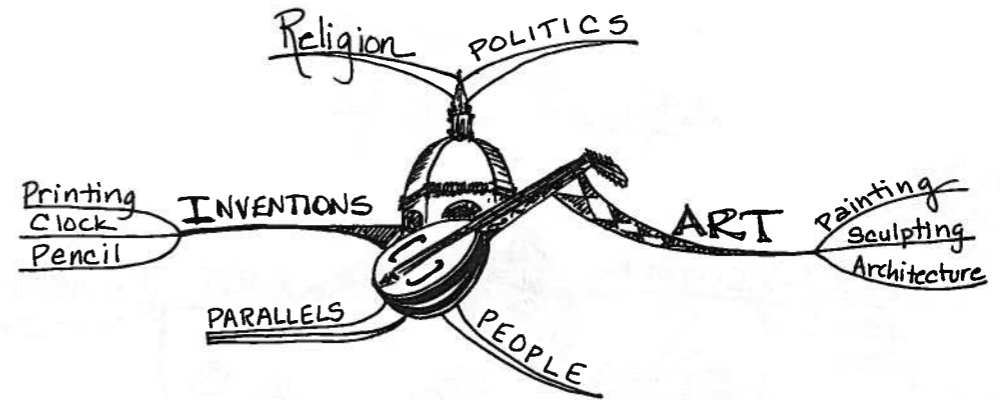
Place the paper horizontally in front of you. A horizontal disposition makes it easier for you to keep all your key words upright and easy to read.





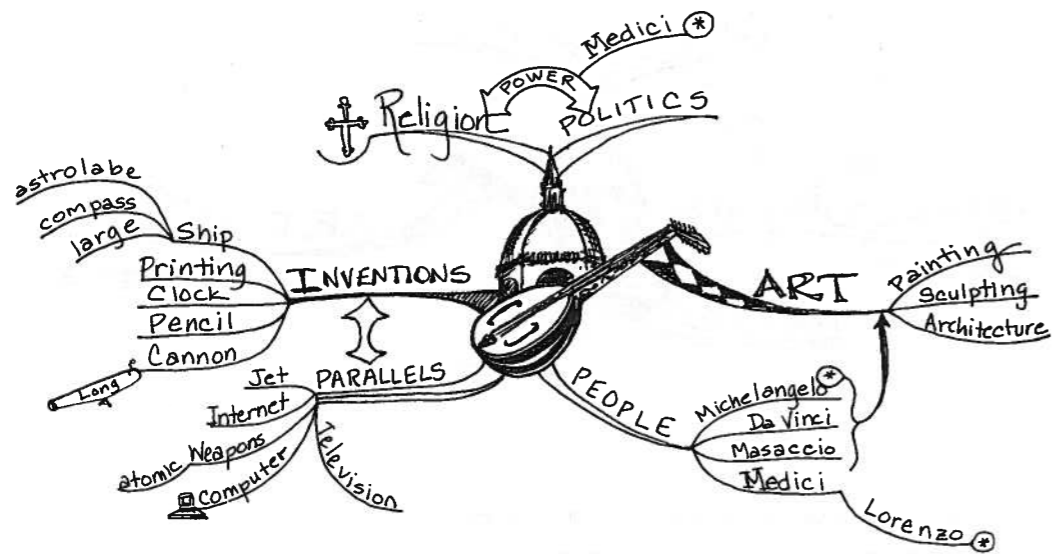
2) Let's say that the topic for this mind map is the Renaissance.

- ♦ 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.



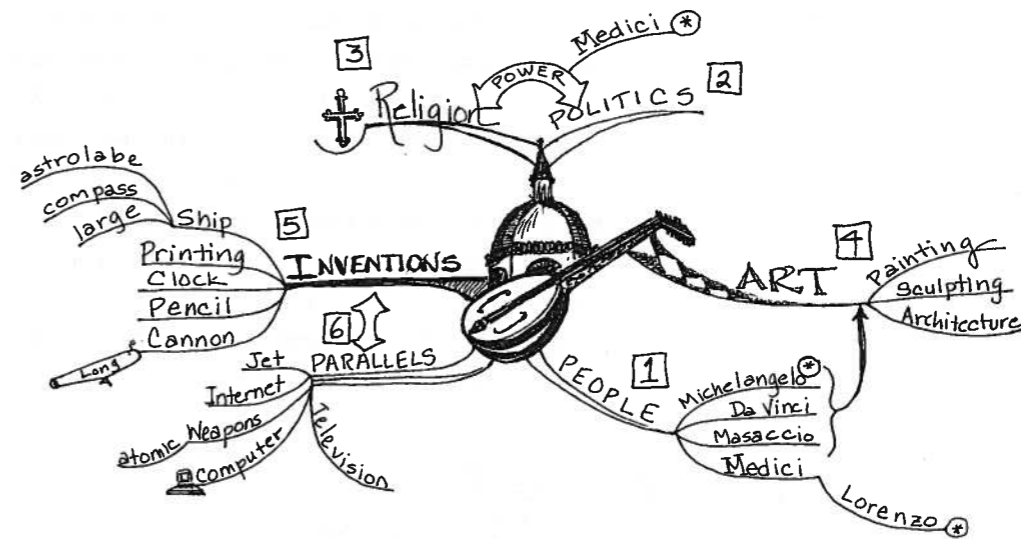
3) Now print key words or draw images on lines radiating out from your central image. (Remember to print *on* the lines, *one* key word or image per line, and keep the lines connected.)

- ♦ 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 prepara-

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.

tion, and systems analysis, it is probably best to make your first few mind maps on relatively simple, light-hearted subjects. Choose one of the following topics to begin practicing your mind-mapping skill, solo. Take about twenty minutes for this first practice map.

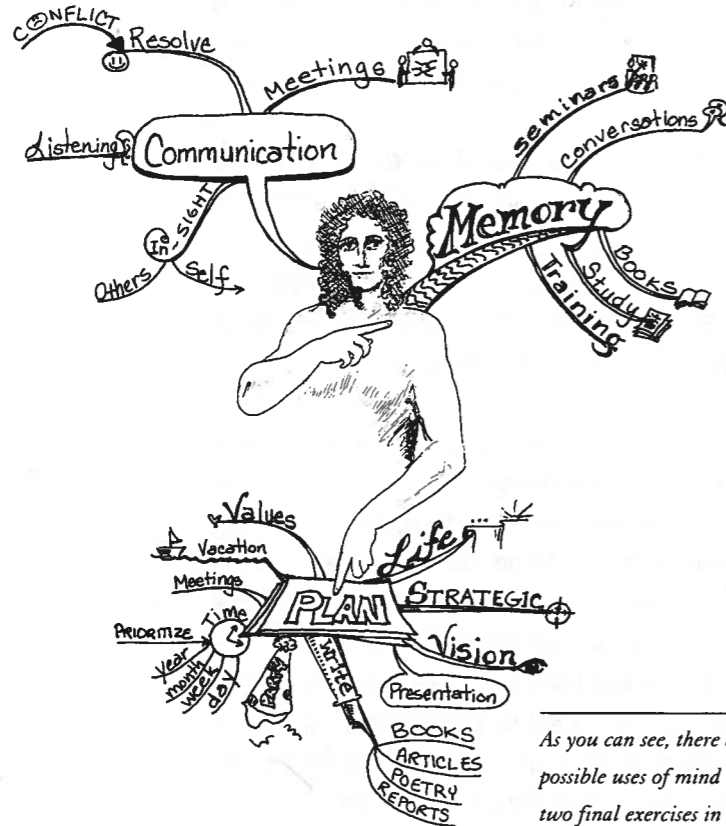
- ◆ Mind Map Your Next Day Off—Begin with a simple drawing that represents a free day (e.g., a smiling sun, a calendar page). Print key words and draw images that express some things you might like to do on your next day off. Remember to put key words and images on lines radiating out from your central 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.



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 to 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 "quickenning your spirit of invention."

