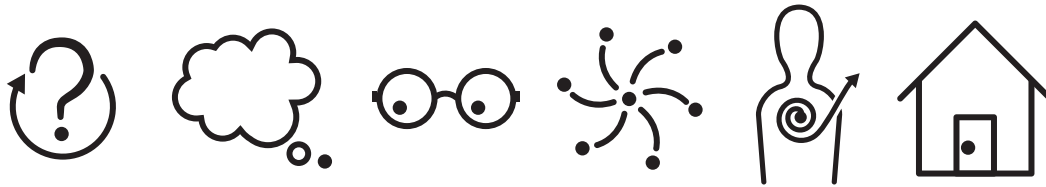# THINKING MAPS®

A Visual Language for Thinking and Learning

Thinking Schools Ethiopia
Professional Development Workshop

*Visual Tools, Reflective Questioning, Collaborative Networking
Developing Dispositions, Thinking Skills, Structuring Environment*

Thinking Schools Ethiopia • Eminence Social Entrepreneurs

Thinking Schools Ethiopia   www.thinkingschoolsethiopia.net

Eminence Social Entrepreneurs   www.eminence-se.org

Thinking Foundation   www.thinkingfoundation.org

Thinking Maps® Inc.   www.thinkingmaps.com

TSI Global Trainer • Robert Price   www.eggplant.org

Thinking Schools International (TSI) www.thinkingschoolsinternational.com

Thinking Maps"': A Language for Leadership; A Language for Learning

Thank You

Systems Thinking

"The word organization is a product of how we think and how we act; [it] cannot change in a fundamental way unless we can change our basic patterns of thinking and interacting."
–Peter Senge
The Learning Organization Made Plain

The Brain

The globalization paradigm emphasizes the fact that information can now travel 15,000 miles in an instant. But the most important part of information's journey is the last few inches – the pace between a person's eyes or ears and the various regions of the brain.

- Does the individual have the capacity to understand the information?
- Does he or she have the training to exploit it?
- Are there cultural assumptions that distort the way it is perceived?

–David Brooks
The Cognitive Age
New York Times • Friday, May 2, 2008

Summary Definition of Visual Tools
Excerpted from the book *Visual Tools for Transforming Information Into Knowledge*
by permission from the author and publisher (David Hyerle and Corwin Press)

Visual tools are nonlinguistic symbol systems used by learners, teachers, and leaders for graphically linking mental and emotional associations to create and communicate rich patterns of thinking. These visual-spatial-verbal displays of understanding support all learners in transforming static information into active knowledge, thus offering a complementary representational system to more traditional literacies grounded in speaking, writing, and numerating. These linear and/or nonlinear visual forms are also metacognitive tools for self-assessment in each content area and for interdisciplinary learning that may unite linguistic, numerical, and scientific languages together on the same page.

brainstorming

As shown in Summary Figure 1, and investigated in this book, there are three basic categories of visual tools, each with specific purposes and visual configurations:

brainstorming webs for fostering creativity and open mindedness;
graphic organizers for fostering analytical content and process specific learning;
conceptual mapping for fostering cognitive development and critical thinking

graphic organizer

A fourth category is a unique **synthesis language of visual tools** that has been used extensively across schools called Thinking Maps® (Hyerle, 1996; Hyerle & Yeager, 2008). This **common visual language of visual tools** integrates the creative dynamism of webs, the analytical structures of content-specific learning, and the continuous cognitive development and reflections fostered through conceptual mapping. Over time, new visual languages may develop that integrate different visual tools and thus enabling a greater range of thinking, communication, and reflection. Visual tools are used for personal, collaborative, and social communication, negotiation of meaning, and networking of ideas. These graphics are constructed by individual or collaborative learners across media networks and mediums such as paper, white boards, and computer screens. Because of the visual accessibility and natural processes of "drawing out" ideas, many of these graphics are used from early childhood through adulthood, and across every dimension of learning, teaching, assessing, and leadership processes.

conceptual mapping
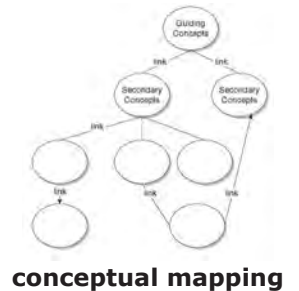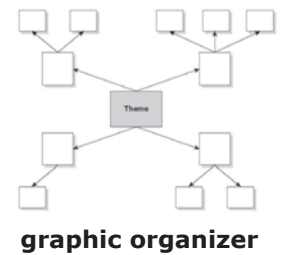
Visual tools are also used across cultures and languages and may become keys to new levels of more democratic participation and communication in human systems. Across traditional cultures and new "virtual" cultures, visual languages ultimately may be used for uniting diverse and distant learning communities as people in schools, communities, and businesses and in different countries seek to understand each other through seeing each others' thinking and perceptions through multiple frames of reference.

Thinking Maps®
common visual language

Summary Definition of Visual Tools from the book:
Visual Tools for Transforming Information Into Knowledge
David Hyerle, Author • Corwin Press, 2008, Second Edition
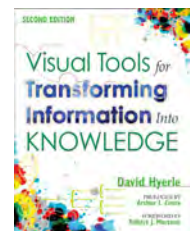
Brainstorming Webs

Figure 4.4   Clustering Overview

Background The "clustering" of ideas using simple ovals and words was first highlighted for educational use by Gabriel Rico. She established a strong link between associative thinking, creativity, drawing, and fluency of thinking and 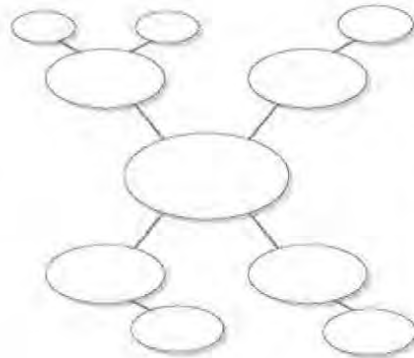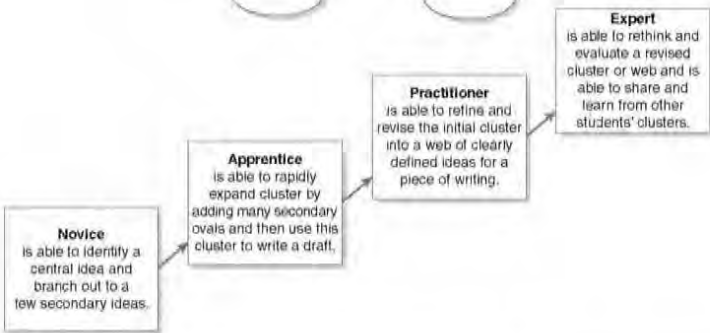emphasized clustering as a prewriting strategy. The simplicity of the techniques for clustering enables all learners to begin the process of being in touch with their own holistic flow of ideas. Rico suggests that after creating initial "clusters" students revise their drawings into more focused "webs," thus leading to greater clarity of thinking and writing.

Basic Techniques

- Begin with an idea and write a phrase or word in a central oval.
- Branch out from the center by adding more words in ovals.
- Extend each of these ovals to provide details or new ideas.
- Make the cluster become a network of associations rather than a structured organization of ideas.

Novice is able to identify a central idea and branch out to a few secondary ideas.

Apprentice is able to rapidly expand cluster by adding many secondary ovals and then use this cluster to write a draft.

Practitioner is able to refine and revise the initial cluster into a web of clearly defined ideas for a piece of writing.

Expert is able to rethink and evaluate a revised cluster or web and is able to share and learn from other students' clusters.
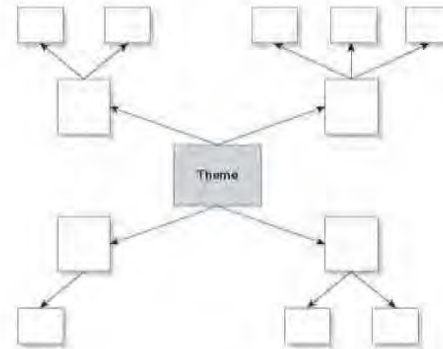
piece of work. Then comes the process of discarding the unusable drafts, brush strokes, doodles, and shards that are absolutely necessary for the creative process, but not for the final product.

deepened by shifting to another organizer, such as one designed especially for analyzing the theme of the story (Figure 5.5). Students and teachers can move from a macro view of various dimensions of the story and to looking specifically at the themes, secondary themes, and details that draw from the macroview. Combining organizers of different types from the story organizer, each with depth in one area, enriches the quality of instruction and learning.

Figure 5.5a   Theme Organizer

Background The theme organizer is a generic form that has been developed and used by many teachers and curriculum developers. It is a key tool in Richard Sinatra's collection of text structures in the Thinking Networks approach and Sandra Parks' "Graphic Organizer" books. It is used as an organizer for reading comprehension across disciplines for supporting students in identifying a main theme, supporting ideas, and details. In this way, it is based on the cognitive skill of categorization, or the grouping of information. Students identify the main theme of a piece of writing and then group the key supporting ideas and details together into smaller boxes. Most often this organizer is presented to students as a blackline master.

Basic Techniques

- Begin by identifying that the text structure is based on developing a central theme and supporting ideas
- Before, during, or after reading, write the main theme of the idea in the center box.
- Continue by adding the secondary ideas in the boxes extending from the central theme and adding details to each.
- Add or delete boxes as necessary.

Theme

Novice is able to fill in a blakline master with the theme and supporting ideas with guidance from a teacher.

Apprentice is able to clearly distinguish between the theme, supporting ideas, and details, and add boxes.

Practitioner is able to make connections between the supporting ideas while constructing the organizer on a blank sheet of paper.

Expert is able to transfer this organizer into every discipline area when reading and writing.

Brainstorming Webs from the book:
Visual Tools for Transforming Information Into Knowledge
David Hyerle, Author • Corwin Press, 2008, Second Edition

Graphic Organizers

Figure 5.4   Story Organizer

Background The story organizer or map is a generic tool used specifically for interpretation of fiction. Other organizers have been developed for analyzing specific tasks for reading a story, such as plot analysis and rising action, and character description, comparison of characters, and for identifying thematic structures. Story organizers such as the one shown below are used to support students in bringing as many of these aspects of the story analysis together on a single page. It reinforces for students that most of these dimensions of the story must be included in the interpretive process for a complete analysis.

Basic Techniques
- Introduce the graphic by telling students that they will later be able to create their own design for a story organizer.
- Model the use of the organizer in front of the class by working through the steps using a story students have already read and discussed.
- Have students work in pairs and then independently until they can draw, expand, and complete the organizer from a blank piece of paper.

Novice is able to fill in the sections of the organizer with guidance from a teacher

Apprentice is able to complete the organizer independently and groups by adding boxes and ovals when necessary

Practitioner is able to draw a similar story organizer from a blank page and use it to write or present a story review.

Expert is able to identify and expand the different aspects of the organizer in order to develop a rich interpretation of a story.

advanced planning, as a focus during reading, and as a reflective and writing plan for after reading. But this multiple-organizer approach also does not provide much depth of thinking about each of the four literary dimensions listed above. This is a common problem with many graphic organizers: too many different patterns being integrated on a page without depth. One of these macro-organizers could be

deepened by shifting to another organizer, such as one designed especially for analyzing the theme of the story (Figure 5.5). Students and teachers can move from a macro view of various dimensions of the story and to looking specifically at the themes, secondary themes, and details that draw from the macroview. Combining organizers of different types from the story organizer, each with depth in one area, enriches the quality of instruction and learning.
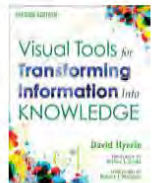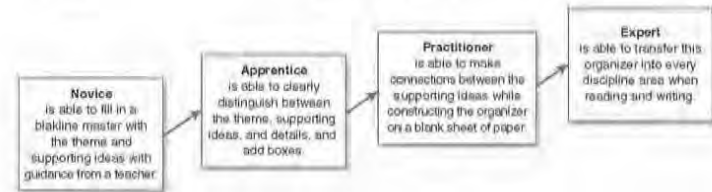
Figure 5.5a   Theme Organizer

Background The theme organizer is a generic form that has been developed and used by many teachers and curriculum developers. It is a key tool in Richard Sinatra's collection of text structures in the Thinking Networks approach and Sandra Parks' "Graphic Organizer" books. It is used as an organizer for reading comprehension across disciplines for supporting students in identifying a main theme, supporting ideas, and details. In this way, it is based on the cognitive skill of categorization, or the grouping of information. Students identify the main theme of a piece of writing and then group the key supporting ideas and details together into smaller boxes. Most often this organizer is presented to students as a blackline master.
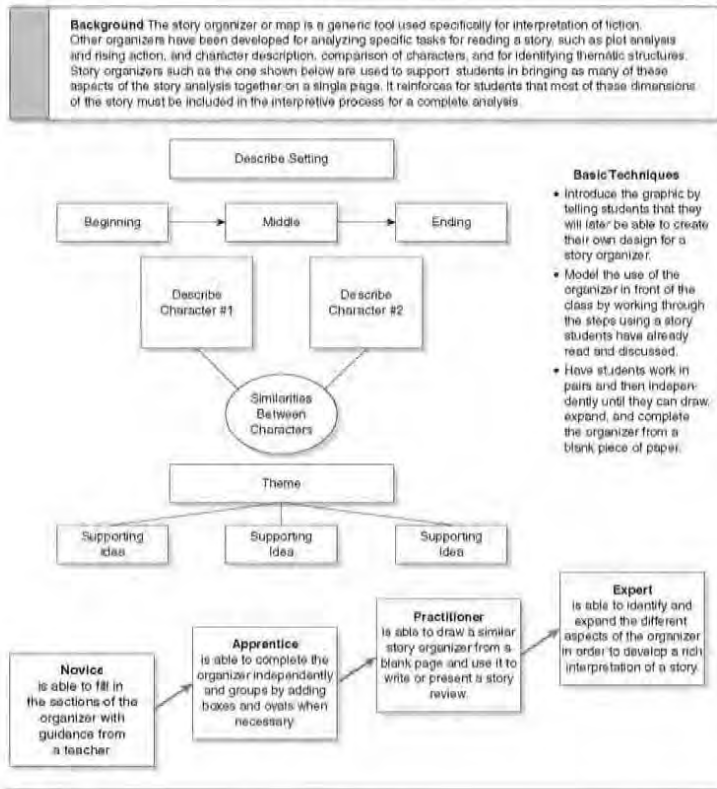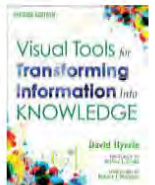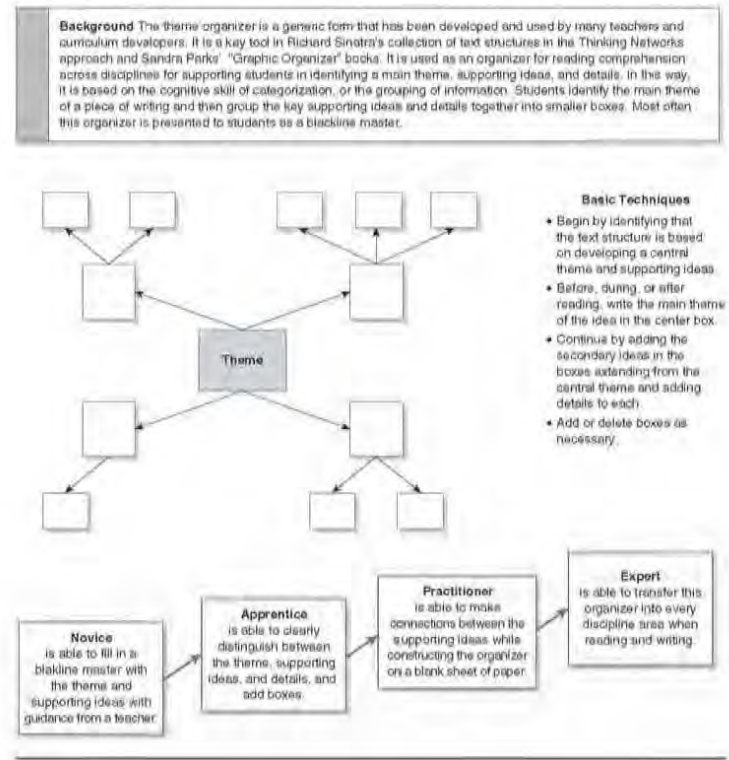
Basic Techniques
- Begin by identifying that the text structure is based on developing a central theme and supporting ideas
- Before, during, or after reading, write the main theme of the idea in the center box.
- Continue by adding the secondary ideas in the boxes extending from the central theme and adding details to each
- Add or delete boxes as necessary.

Novice is able to fill in a blakline master with the theme and supporting ideas with guidance from a teacher

Apprentice is able to clearly distinguish between the theme, supporting ideas, and details, and add boxes

Practitioner is able to make connections between the supporting ideas while constructing the organizer on a blank sheet of paper

Expert is able to transfer this organizer into every discipline area when reading and writing.

Graphic Organizers from the book:
Visual Tools for Transforming Information Into Knowledge
David Hyerle, Author • Corwin Press, 2008, Second Edition

Conceptual Mapping

Figure 6.3   Concept Mapping Overview

Background Concept mapping was developed by Joseph Novak and Robert Gowin, both of Cornell University. The term "concept mapping" is often used incorrectly as a generic term for any kind of semantic map, but as shown below the processes for using this tool have been systematically developed and researched. Novak and Gowin believe that concepts are linked together in the mind in a hierarchical system of relationships and interrelationships. New information is assimilated under an umbrella of more generalized concepts. The same array of concepts may be mapped differently and still be conceptually correct.

Basic Techniques

- Begin with a guiding concept at the top of the map in a single oval.
- Identify secondary concepts below by drawing ovals and writing phrases that link guiding to secondary concepts.
- Below the secondary concepts, continue to draw ovals and links as supporting details.
- Show interrelationships between different levels of the concept map so that the ideas become fully integrated.

Expert is able to assess concept maps by giving numerical ratings to the hierarchy of conceptual links.

Practitioner is able to revise the map as new information is assimilated from other maps.

Apprentice is able to create a complete concept map with links shown between concepts at different levels.

Novice is able to begin by identifying an idea at the top and show underlying concepts in ovals.

Figure 6.7   Systems Feedback Loops Overview

Background Systems feedback loops have been used in many fields to show cycles: a simple feedback loop that every elementary child learns about is the precipitation cycle. When students learn about predator-prey relationships and food chains, feedback loops may be used to show the dynamic interrelationships among the variables in a system. Systems thinking as a way of understanding the world has evolved from business and industry applications in the 1950s and has gained visibility in the field of education through the work of Peter Senge of M.I.T. While systems thinking does not absolutely require mapping using feedback loops, it is hard to imagine representing a system and all its complex interdependencies other than through visual means.

Basic Techniques

- Begin by thinking about the most important variables in a system.
- Sketch a causal loop between two or three of these variables, jotting down how they relate to each other.
- Extend each of these variables into new causal loops which show secondary influences on the system.
- Expand the feedback loops until you have mapped the key elements of the system.

Expert is able to refine and evaluate the system map, identifying frames of references and faulty assumptions.

Practitioner is able to discern to what degree each variable influences the overall system and change the model.

Apprentice is able to expand the number of causal loops and begin to build a system of interdependent loops.

Novice is able to show a simple causal loop between variables.

Every school has implicit and explicit ways of nurturing learning and measuring progress. Often the differences from school to school are impossible to see. But at the Murdoch Middle School, Peter Senge's Five Disciplines (Personal Mastery , Mental

Conceptual Mapping from the book:
Visual Tools for Transforming Information Into Knowledge
David Hyerle, Author • Corwin Press, 2008, Second Edition
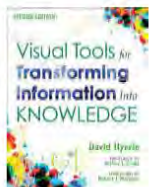
Thinking Maps®

Figure 7.1 Thinking Maps Overview

Background Thinking Maps® is a language, or tool-kit, of eight thinking process maps, developed by David Hyerle. Each map is graphically consistent and flexible so that students may easily expand the map to reflect the content pattern being learned. Thinking Maps® are introduced to students as tools for reading and writing, content-specific learning, and for interdisciplinary investigations. Over time, students learn to use multiple maps together and become fluent in choosing which maps fit the immediate context of learning. Thinking Maps® and Thinking Maps® Software are used in whole schools through faculty training and follow-up.
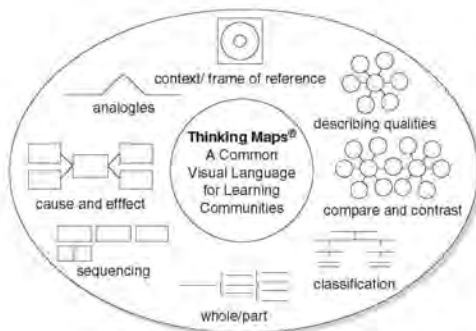
Basic Techniques

- Begin with an application of each of the maps to a concrete object in order to understand the relationship between thinking processes and Thinking Maps®.
- Expand each map to show the big picture and then prioritize information by deleting ideas from maps for reading comprehension and writing.
- Use multiple maps together to construct related patterns of learning, and use "frame" to identify frames of reference.

context/ frame of reference

analogies

describing qualities

Thinking Maps® A Common Visual Language for Learning Communities

cause and effect

compare and contrast

sequencing

classification

whole/part

Novice is able to identify the thinking process related to each map and use single maps for different content tasks.

Apprentice is able to use multiple maps together in order to develop a product, such as writing an essay.

Practitioner is able to independently choose and fluently apply the maps in cooperative groups.

Expert is able to independently use the frame of reference with the other maps to self-assess learning.

Figure 7.4 The Cognitive Bridge to Literacy

The Cognitive Bridge to Literacy

Reading Text Structures	Thinking Skills THINKING MAPS©	Writing Prompts
Defining Context, Perspective	Circle Map — Defining in Context	Point-of-View Essay
Description, Characterization	Bubble Map — Describing	Descriptive Writing
Comparison-Contrast	Double Bubble Map — Comparing/Contrasting	Comparison Essay
Theme, Main Idea-Details	Tree Map — Classifying	Persuasive Writing Essay
Setting, Physical Parts	Map — Whole-Parts	Technical Writing
Chronology, Sequence-Plot	Flow Map — Sequencing	Narrative Writing
Problem-Solution, Conflict	Multi-Flow Map — Cause-Effect	Prediction, Cause-Effect
Comparison by Analogy	Bridge Map — Seeing Analogies	Reasoning by Analogy

Brainstorming Webs from the book:
Visual Tools for Transforming Information Into Knowledge
David Hyerle, Author • Corwin Press, 2008, Second Edition

Thinking Maps : A Language for Learning
This is the Thinking Maps® training / resource manual for all teachers in grades K-12. It includes classroom posters, black line masters and a specific methodology for introducing, teaching, transferring, integrating and assessing the impact of the Thinking Maps® common visual language.

Thinking Maps : A Language for Learning Trainer's Guide
This is a special resource manual for those interested in becoming trainers of the Thinking Maps® common visual language. This manual, in conjunction with the extensive Training of Trainers professional development plan, prepares skilled educators to enhance the learning process of others within their own region, district, or school, through the unique language of Thinking Maps®.
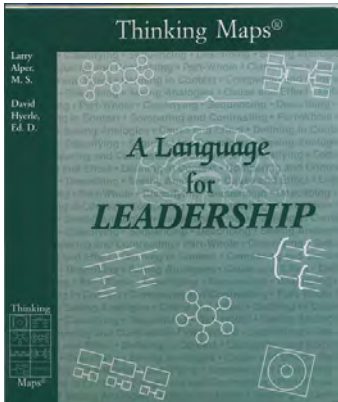
Thinking Maps®: A Language for Leadership
A Language for Leadership is designed to meet the needs of multiple audiences. It can be used by leaders and leadership teams who want to strengthen and deepen their current Thinking Maps® implementation, and assist those who want to expand their use of these tools into leadership practices. This guide and associated professional development can also serve as an entry point for schools to begin the process of implementing Thinking Maps®.

Circle Map		Tree Map
Bubble Map		Double Bubble Map
Flow Map		Multi-Flow Map
Brace Map		Bridge Map
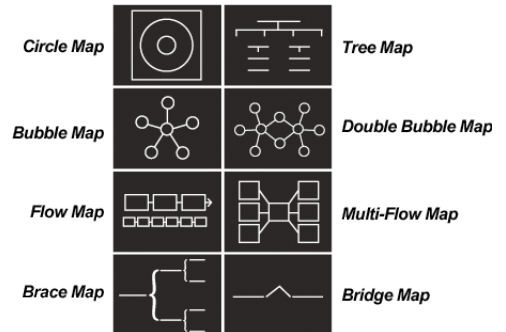
Thinking Maps® Guides and Books
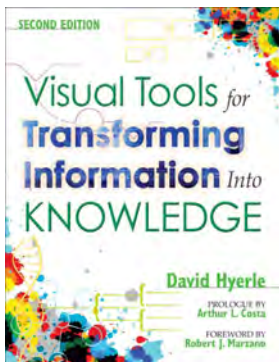
Visual Tools for Transforming Information Into Knowledge - Second Edition
By David Hyerle, ©2009, Corwin Press
Visual tools have the unique capacity to communicate rich patterns of thinking and help students take control of their own learning. This second edition of A Field Guide to Using Visual Tools shows teachers of all grades and disciplines how to use these tools to improve instruction and generate significant positive changes in students' cognitive development and classroom performance.

Expert David Hyerle describes three basic types of visual tools: brainstorming webs that nurture creativity, graphic organizers that build analytical skills and help process specific content, and concept maps that promote cognitive development and critical thinking. Updated with new research and applications for three kinds of Thinking Maps®.
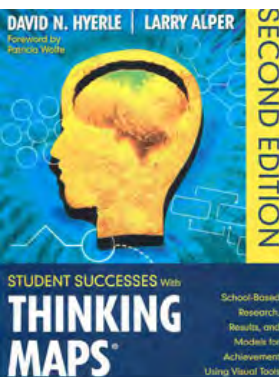
Student Successes With Thinking Maps® • School-Based Research, Results, and Models for Achievement Using Visual Tools Second Edition
By David Hyerle and Larry Alper, ©2011, Corwin Press
Neuroscientists tell us that the brain organizes information in networks and maps. What better way to teach students to express their ideas than with the same method used by the brain? Student Successes With Thinking Maps presents eight powerful visual models that boost all learners' metacognitive and critical thinking skills. Enriched with new research, a wealth of examples, and cross-content applications, the book also shows how Thinking Maps serve as valuable assessment tools. Additionally, educators have found that using Thinking Maps for professional development can improve teacher performance, build leadership skills, and raise students' scores on high-stakes tests.

Why a "New" Language?

"A specialized language both shapes and reflects a group's culture."

Lee G. Bolman and Terrence E. Deal
<u>Reframing Organizations</u>

Thinking Maps, a common, visual language for thinking, implicitly and explicitly places the value of thinking, feeling and surfacing multiple frames of reference at the heart of the identity and purpose of a school. Through the communication and collective construction of ideas, a landscape for learning develops, one that is continually nurtured by the involvement of all members and strengthened by the bond of a shared language. Thinking Maps, then, can be viewed as a language for the 21st Century. They are the vehicle for opening the space between and among people, where ideas can be communicated, mediated and reflected upon. With Thinking Maps, complexity can be embraced with the confidence that problems may be discussed and understood and solutions can be planned for and attained.

"A learning organization is an organization that is continually expanding its capacity to create its future."

Peter Senge
<u>The Fifth Discipline</u>

The development of verbal language marked a significant change in human communication from pictures, gestures and actions to codified words, written and oral. This apparent advance in communication also had its limitations. It failed to integrate the linear stream of words we use to express ourselves with a visual representation of our thinking. The holism of our thinking, not always readily accessible, makes verbal language alone an inadequate tool for capturing, communicating and understanding what we think. The belief systems that frame who we are and how we think and feel often remain unshared and unexamined.

Thinking Maps represent an advance in human communication. In organizational settings, the use of this common language increases the capacity of the members to meaningfully engage in dialogues about purpose. It fosters rich connectedness among participants and involves all people in the school community in the learning process.

Introducing and Defining Thinking Maps

What Makes Thinking Maps So Effective?

Thinking Maps are <u>Visual Patterns</u> for constructing knowledge.

- We know that we learn in many different ways, that the brain takes in information kinesthetically, auditorally and visually. In fact, much of the current research supports the belief that our ability to learn visually is greater than any of our other senses.

- Visualizing our thinking allows us to have a concrete image of our abstract thoughts.

Thinking Maps are <u>Based on Eight Basic Cognitive Processes.</u>

- Each visual representation is linked to a specific thought process: Defining in Context, Describing Attributes/Qualities, Comparing and Contrasting, Classifying/Grouping Ideas, Whole-Part, Sequencing, Cause-Effect and Seeing Analogies.

- Learners connect a concrete visual image with a specific abstract thought process.

- By connecting a visual with a specific thought process, learners create patterns for thinking based on these eight cognitive skills.

- These patterns become visual tools that learners use to recognize thought processes whenever they read, discuss or write.

Thinking Maps are <u>Combined for Depth of Thought.</u>

- Thinking Maps are most effective when used in combination to fully develop a concept or theme.

- Learners may create two Bubble Maps and then use the information to create a Double Bubble Map to compare and contrast the subjects; events within a Flow Map may be analyzed to discuss the causes and/or effects of one major event.

- Learners can take and/or review notes by creating all eight maps in order to think deeply about a topic.

- Writing involves multiple thinking processes. A combination of Thinking Maps can be used, for example, to brainstorm a topic (Circle Map), elaborate on the main ideas and supporting details (Tree Map) and then organize a piece of writing into a coherent sequence (Flow Map).

Introducing and Defining Thinking Maps

What Makes Thinking Maps So Effective?

Thinking Maps can be Applied in All Content Areas.

- All content areas require learners to think. Thinking Maps are *thinking -specific*, not task- specific, tools. Therefore, learners can use one or more of the Thinking Maps with any content area.

- In all aspects of life, learners are dependent upon their ability to **think**—critically, creatively, analytically, independently and compassionately—in order to be successful and to contribute positively to those around them. Thinking Maps can be tools for acting confidently and constructively in the world.

Thinking Maps can be Used By All Teachers.

- Because teachers at all levels are involved in teaching cognition, they can all use the same eight Thinking Maps.

- The depth and complexity of the Thinking Maps will grow and change based on the developmental ability of the student.

Figure 1-4
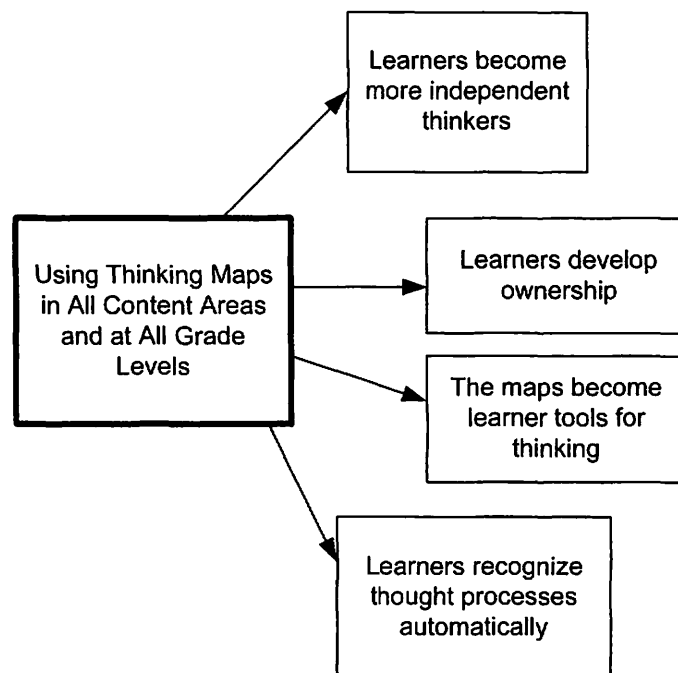
Thinking Maps are so effective because they give all learners and teachers a common language for meaningful learning. The consistency and flexibility of each of the Thinking Maps promotes student-centered and cooperative learning, concept development, reflective thinking, creativity, clarity of communication and continuous cognitive development.

QUESTIONS FROM TEXTS, TEACHERS AND TESTS	THINKING PROCESSES	THINKING MAPS AS TOOLS	
How are you defining this thing or idea? What is the context? What is your frame of reference?	**DEFINING IN CONTEXT**	Circle Map	
How are you describing this thing? Which adjectives would best describe this thing?	**DESCRIBING QUALITIES**	Bubble Map	
What are the similar and different qualities of these things? Which qualities do you value most? Why?	**COMPARING AND CONTRASTING**	Double Bubble Map	
What are the main ideas, supporting ideas and details in this information?	**CLASSIFYING**	Tree Map	
What are the component parts and subparts of this whole physical object?	**PART-WHOLE**	Brace Map	
What happened? What is the sequence of events? What are the substages?	**SEQUENCING**	Flow Map	
What are the causes and effects of this event? What might happen next?	**CAUSE AND EFFECT**	Multi-Flow Map	
What is the analogy being used? What is the guiding metaphor?	**SEEING ANALOGIES**	Bridge Map	Relating Factor
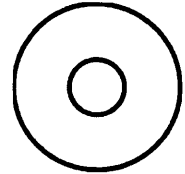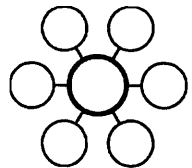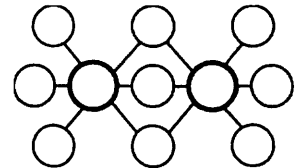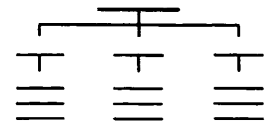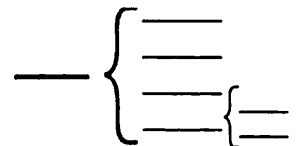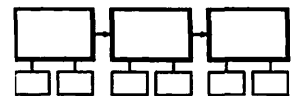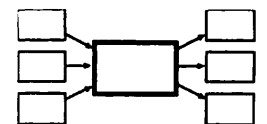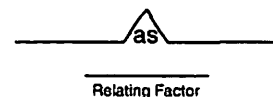
Frame for Frame of Reference

Thinking is influenced by "frames." Frames are our overlapping personal and cultural experiences, values and belief systems. These multiple background frames give reference to and guide thinking, emotions and judgments. Surfacing our "frames" or **mental models** (Senge) enables us to begin to see what influences the evolving patterns of thinking developed in the maps. We more fully appreciate the human dimension of ideas and the diversity within the organization. Each of the maps is a view of one's cognitive pattern. The Frame represents one's **metacognition**, or reflection on this pattern.

"Leaders as teachers help people restructure their views of reality and therefore to see new possibilities for shaping the future."

Peter Senge
The Fifth Discipline

The Frame

The Frame is used around any of the eight Maps. After creating a Thinking Map, draw a square "frame" around the map you are using. Within the frame, identify information that shows the influence of background **values, experiences and belief systems** that influence the map you have created. Sharing this Frame with others offen enables conversations to evolve from positional to collaborative. Seeing from another person's Frame is much like stepping into their shoes and seeing their thinking from their point of view.

Figure 2-1

ANY THINKING MAP ···
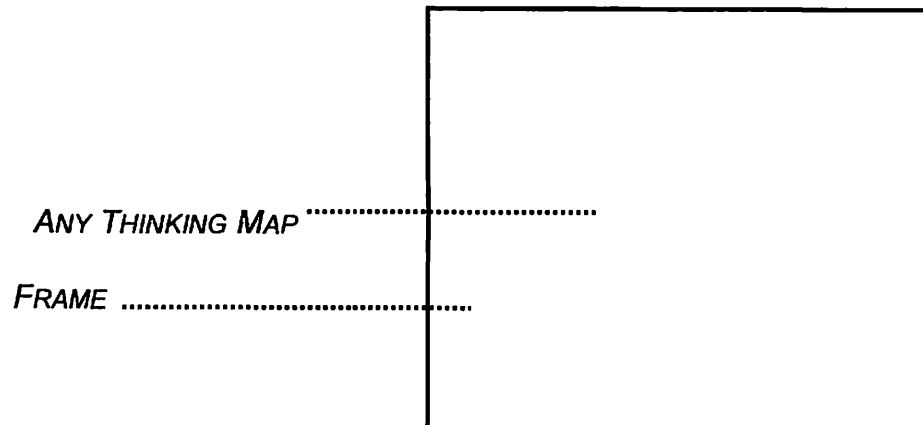
FRAME ···

Questioning Using the Frame

Where did you get this information (workshops, books, people, etc.) to support your view?
What prior knowledge and experiences influence your view?
What are the cultural influences on your perspective (age, gender, ethnic, religious, political, geographic, class, etc.)?
What are the belief systems which may influence how you/ others define terms, issues, and/or ideas?
What would be the influences, values and beliefs shaping another person's ideas?

Frame for Frame of Reference

A Process for Using the Frame

The members of a leadership team began their consideration of alternative approaches to improve student achievement by defining their goals for the students in their schools using a Circle Map. Doing this first individually, the team was then asked to Frame their responses by identifying the experiences, beliefs, people, external forces, etc. that influenced the ideas they had included in their Circle Maps. As shown below, their individual responses were combined into one Map to be shared and discussed.

> "The starting point for what's worth fighting for is not system change, not change in others around us, but change in ourselves."
>
> Michael Fullan
> What's Worth Fighting for in the Principalship

Figure 2-2
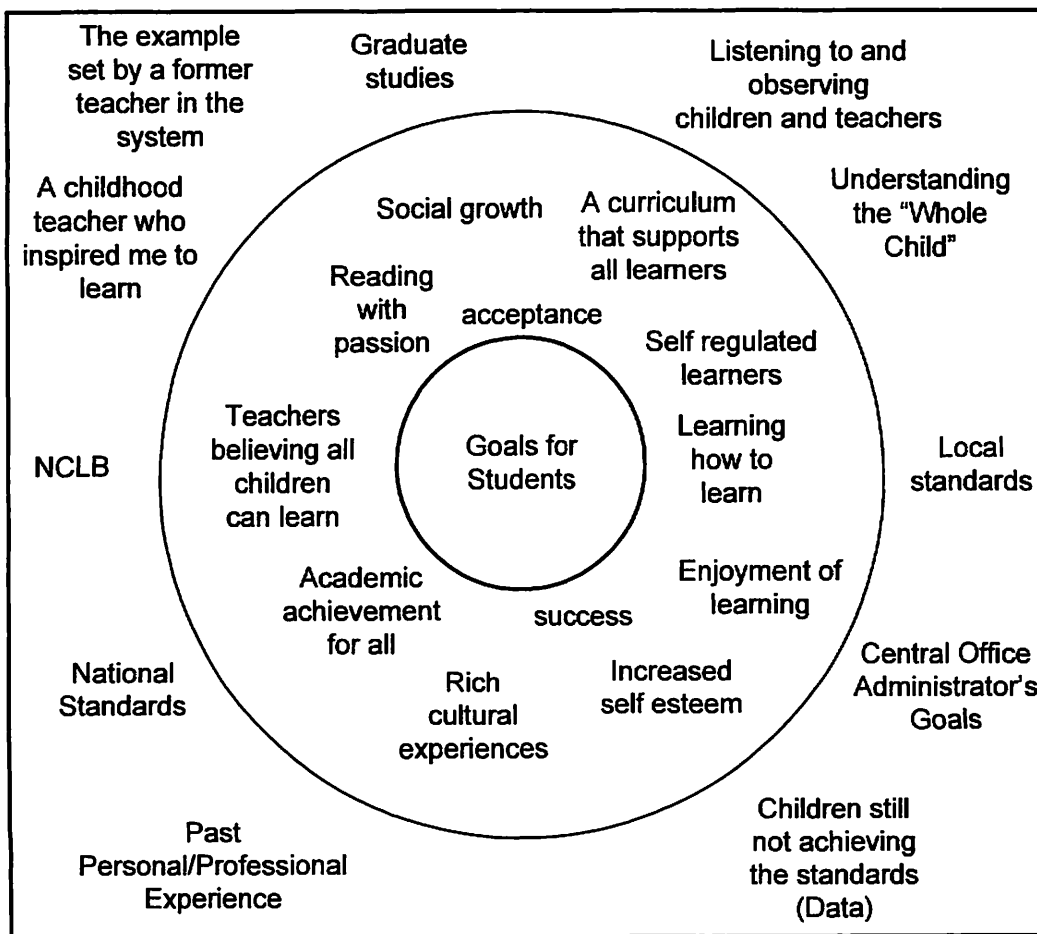
Circle Map for Defining in Context

Thinking Process
Defining in Context is the process of becoming aware of and defining some "thing" in context by representing it using signs, symbols or drawings.

Thinking Map
The Circle Map is used for **brainstorming ideas** and for showing **prior knowledge** about a topic by providing context information. In the center circle use words, numbers, pictures or any other sign or symbol to **represent** the object, person or idea you are trying to understand and **define**. In the outside circle write or draw any information that puts this thing in **context**.

Figure 2-3

WORD/SYMBOL
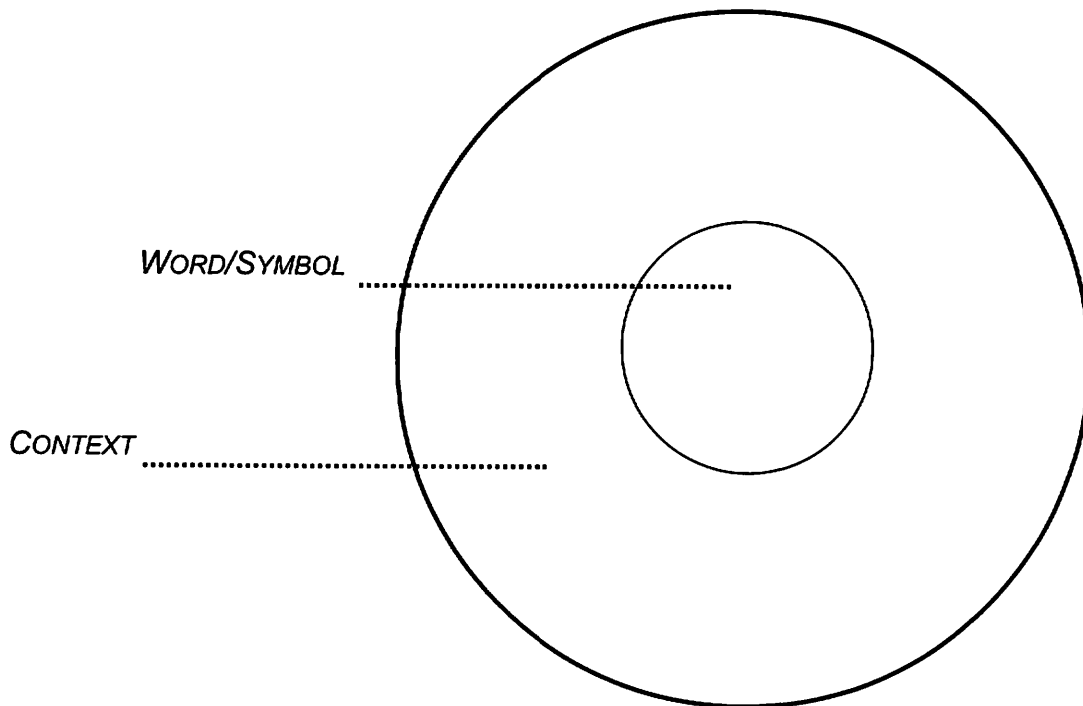
CONTEXT

Questioning Using the Circle Map
What do you know--or need to know--about this issue or topic?
How have you named or represented this idea?
How has this name helped define this idea?
What is your prior knowledge about this idea?
What is the context information that gives definition to this issue?
How would you define this thing in this context?

Circle Map for Defining in Context

Example

Below is an example of one school's application of the Circle Map to the topic "sources of stress" within the school environment as a first step toward transforming these issues into opportunities for growth. The guiding question for this process was, "What are the sources of stress in our professional lives that impact our work?"

Figure 2-4

Data on student behavior

Interactions with parents

Lunchtime conversations with colleagues

Narcissism of minor differences

Limited rewards, recognition, and resources

Social and emotional issues of students and families

Stresses in our school environment

Lack of services for students

Effects of testing on kids, families, and teachers

Differences in philosophy and values

isolation

Newspaper reports

Special education meetings

Circle Map for Defining in Context

Notice that the Frame includes experiences and information from the staff showing the various ways their thoughts were formed. In this particular interaction, the Frame helped staff members to reflect on how these different experiences contributed to each person's perception of the problem. Such understanding is essential before groups can successfully move on to identifying possible action steps to address the issue.

Discussion

Though one does not need to begin an investigation with this tool, the Circle Map is an effective tool for brainstorming ideas about a topic. After generating ideas people begin to see connection within the Map or identify ideas about which they are curious to learn more. When followed by the use of other Thinking Maps for organizing information in different ways, the Circle Map may lead the way for problem-solving processes and producing carefully considered outcomes.

The Circle Map and Frame can also provide an in-the-moment assessment of an organization's current status and thinking about an issue. It can also be used during the long process of implementing a solution. This tool can become a quick, reflective "dip stick" to gauge what and how colleagues are thinking about a process. Some leaders have used the Circle Map as a "before" and "after" assessment, comparing two Circle Maps from different phases of a process.

Student Examples

The Circle Map and Frame of Reference can be used effectively by students for defining in context. In the elementary example on the following page, notice how the Circle Map and Frame are used by students in a class to identify prior knowledge and sources of information about rocks. The process of using the Circle Map and Frame activated the students' thinking and curiosity about this topic. It also provided the teacher with an in-the-moment assessment of the students' current level of knowledge and understanding. This information was invaluable to the teacher as he made key instructional decisions for individual students and the entire group. To learn more about this particular student application and to see how it was linked to other maps, see Student Successes with Thinking Maps (Corwin Press, 2004), Chapter 1.

In the second example, a group of high school students used the Circle Map to generate questions they were interested in pursuing in order to build a deeper understanding of the election process in this country. The students then used the Frame of Reference to identify resources they could use to access this information. Looking at each of their questions, what thinking processes are being prompted and which map(s) could facilitate their further investigation into this topic? Refer to page 33 to assist you in this task.

Circle Map for Defining in Context

Figure 2-5

Observing rocks with a microscope

Reading about rocks

Finding and observing

Seeing rocks in a museum

Get colors from minerals

Used as a paperweight

Crystals and geodes

Used for crushing things

Used to make fire

Used to make concrete

Used for building

Crushed by water

Used to make fire

movies

Minerals that are microscopic

Lava is melted rock

A leaf can become a fossil

Made of atoms

Rocks

Geologists study rocks

Some have layers

Some are made of other rocks

Can be made by volcanoes

Three kinds (igneous, sedimentary, metamorphic)

Can be formed from dirt, leaves, mud and sand pressed

Break and make sand

Going to a rock party

Boulders break other things

Studying about rocks

Bubble Map for Describing Qualities

Thinking Process

The process of **describing** is based on the use of words that identify qualities: character traits, emotional responses and other descriptors that reveal a more distinct representation of a problem, idea or person.

Thinking Map

The Bubble Map is used for **describing** through the use of **adjectives** and **adjective phrases**. Unlike the Circle Map that is used for brainstorming, the Bubble Map is a tool for specifically identifying qualities and characteristics and for refining the use of descriptive words. In the center circle, write the word or thing being "described." In the outside "bubbles," write in adjectives and/or adjective phrases to describe something.

Figure 2-5

DESCRIPTIVE QUALITIES USING ADJECTIVES / ADJECTIVE PHRASES

TOPIC BEING DESCRIBED
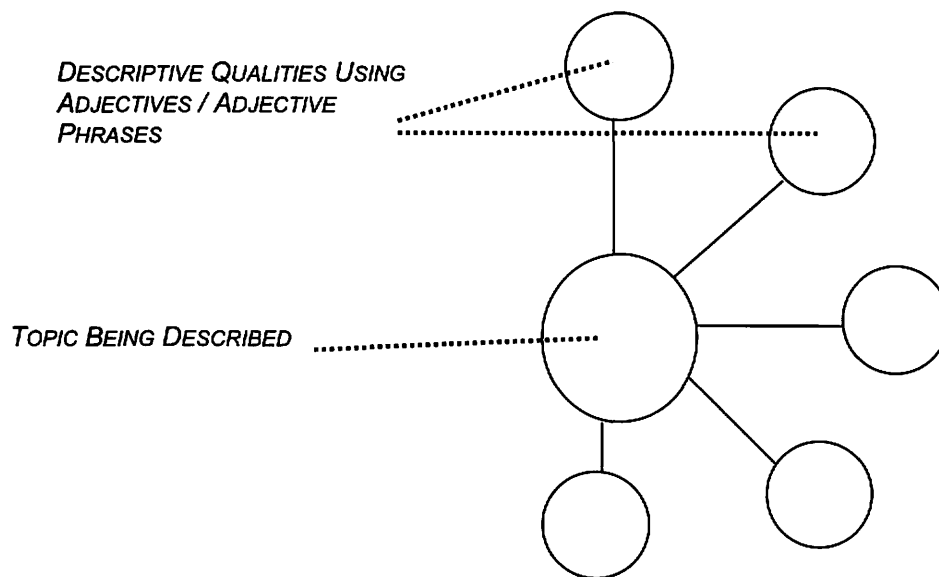
Questioning Using the Bubble Map

What adjectives or adjective phrases describe this idea or topic? If you can think of only nouns for this idea, ask yourself these questions:

*   What adjective would add to the description of this topic?
*   Using some scale for comparison, what are the logical qualities (e.g., novice, challenging, complex)?
*   Using your emotional/aesthetic sensitivities, what qualities are feeling-based (e.g., exciting, frustrating, inspiring)?

Bubble Map for Describing Qualities

Example

The Bubble Map explicitly surfaces the descriptors--attributes or qualities--of objects, people, ideas, etc. *This is not a web or simple semantic map.* In this example it was important for this group to ask the following "Frame" questions: "Who are the stakeholders? To whom is this important? Why?" Notice the rich use of adjectives.

Figure 2-8
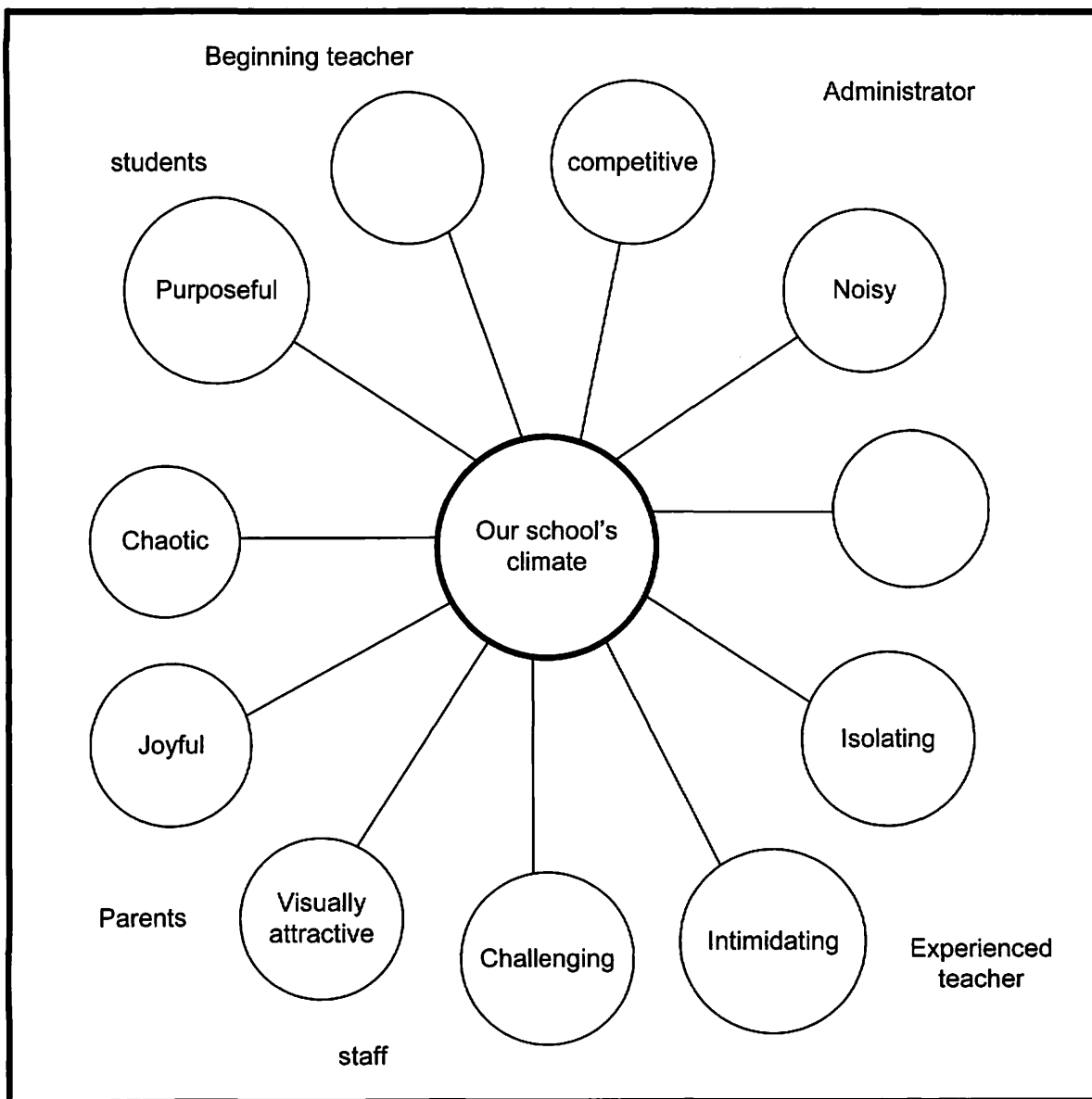
Bubble Map for Describing Qualities

The descriptors developed by framing questions supported colleagues in thinking much more deeply about their logical and emotional perceptions of the situation. Using the Frame asks each person to reflect on what they drew upon for each quality of the school's climate that they described. This metacognitive use of the Frame facilitates critical thinking and perspective taking. It assists group members in articulating their reasoning and in appreciating the context of each other's point of view and thinking.

Discussion

The process of describing is closely linked to how we value and evaluate ideas and processes. By using descriptive words (adjectives and adjective phrases) we tap into our experiences on a fundamental level and open doors to further inquiry. In the previous example, we may ask, "What is a healthy school climate?" In order to answer this question we must first consider it from the point of view of the stakeholders and identify the qualities (characteristics, attributes, properties) valued by each constituent group. From these descriptions, a shared vision of what we want a school to look, sound and feel like can be created and serve as a tool for evaluating the school's practices and guiding its decision making.

Student Examples

In the elementary example on the following page, the Bubble Map is used by a kindergarten student to articulate her descriptions of the sun. Notice that the adjectives and drawings being used are closely associated with her senses to identify key properties of the sun. With this information, the teacher has the opportunity to build upon the student's knowledge of the sun and help her develop richer vocabulary to express her ideas.

The secondary example shows the use of a Bubble Map by a high school student to describe the character traits of Medea, as inferred from the story and as used directly by the author. In this instance, the teacher could ask the student to use the Frame of Reference to note the specific pages and passages that support the use of these adjectives to describe Medea. As a follow-up to this activity, the student could be asked to use a Multi-Flow Map to show the factors that contributed to the development of these traits (causes) and the effects of any or all of these traits on the other characters and events in the story.

Notice that although the level of sophistication in the language and application of the Bubble Map is quite different in these two examples, the thinking process is the same: describing characteristics, properties and traits using adjectives and adjective phrases.

Bubble Map for Describing Qualities

Figure 2-9
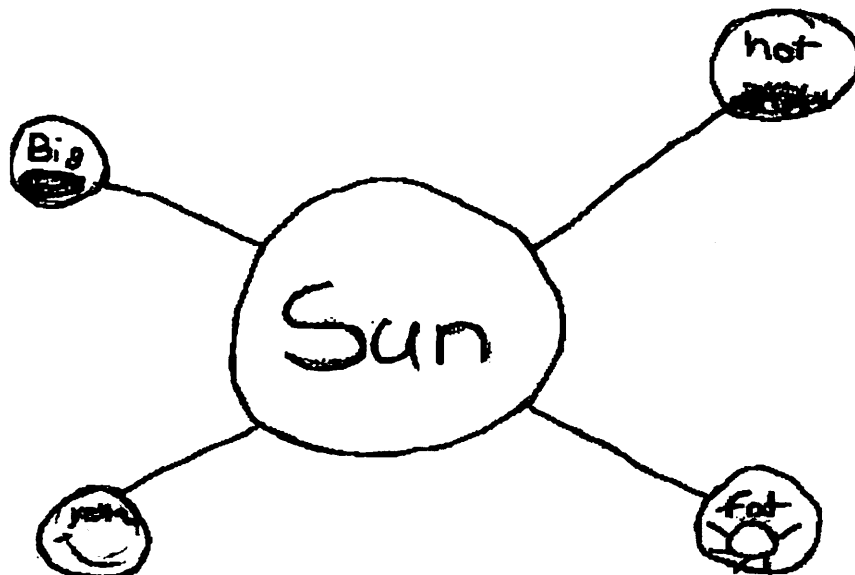
Figure 2-10
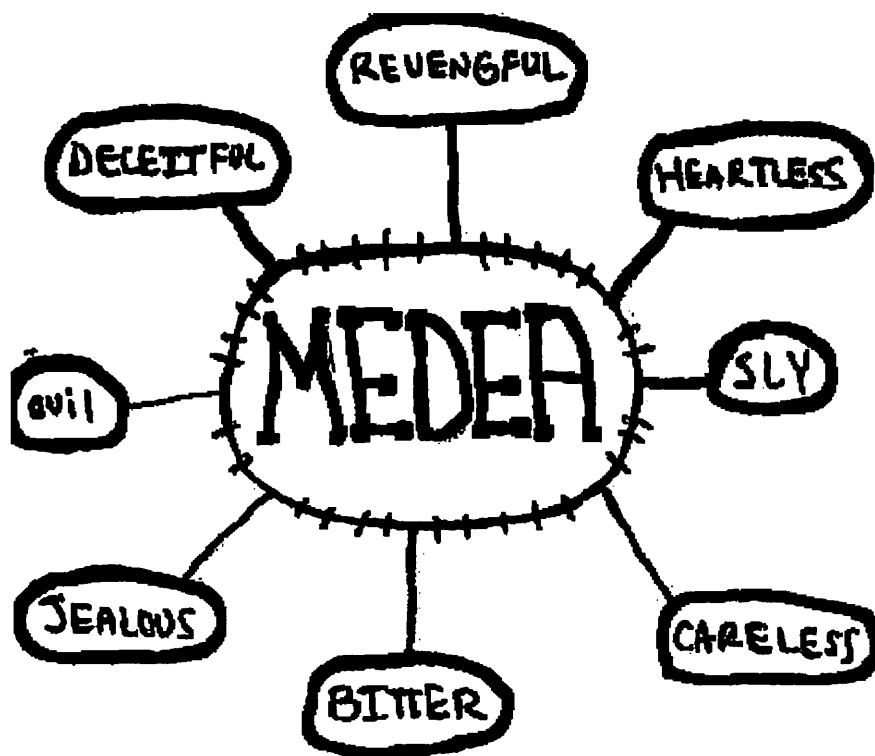
Double Bubble Map for Comparing and Contrasting

Thinking Process
An extension of "describing" one thing is the process of **comparing and contrasting** things according to similar and different qualities.
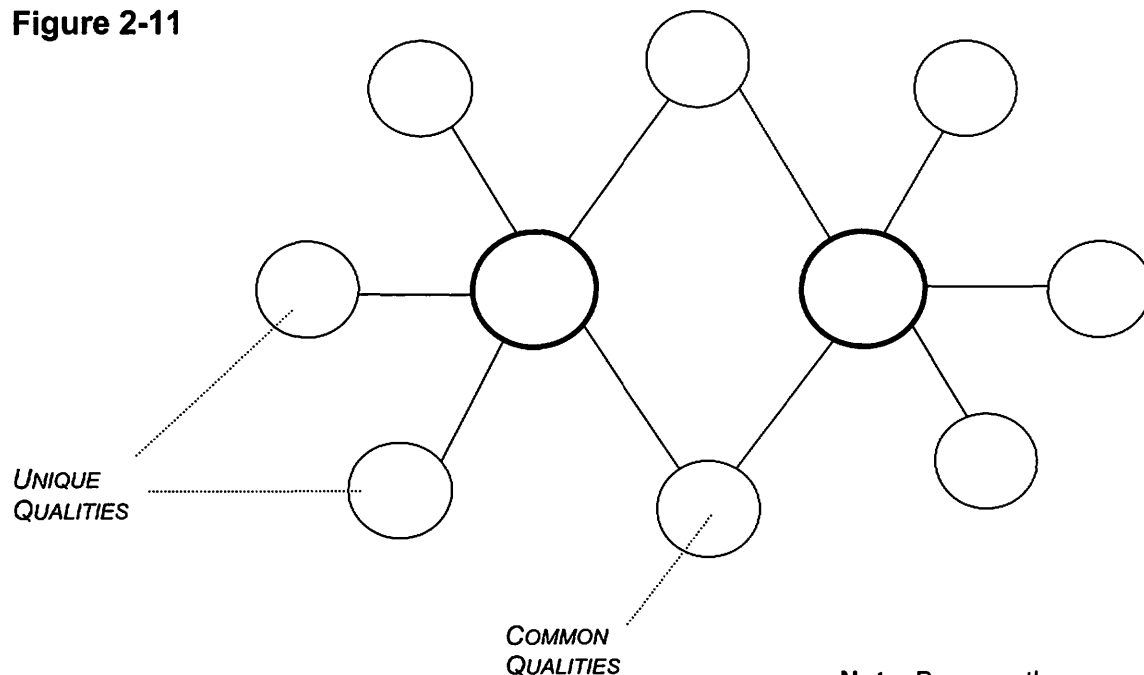
Thinking Map
The Double Bubble Map is a tool for comparing and contrasting things. In the large circles, write the words for the two things being investigated. In the middle "bubbles," use words and phrases that show similarity between the two things. In the outside bubbles, as connected respectively to the two things, write the words that identify their different qualities.

Questioning Using the Double Bubble Map
What are the similarities and differences between these two issues, solutions and ideas?
Based on your purpose, what are the *corresponding*, relevant qualities to compare and contrast about these two events? What are the most important qualities that are similar and different about these two ideas or people?

Figure 2-11

UNIQUE
QUALITIES

COMMON
QUALITIES

Note: Because the thinking process is comparing and contrasting, it is **not** necessary to use only adjectives.

Double Bubble Map for Comparing and Contrasting

Example

Drawing on the work of Michael Fullan and others, a school began a conversation about the concept of being a Professional Community and the implications that had for promoting student success and managing change. To help them more fully appreciate the value of this concept, the staff used a Double Bubble Map to compare professional communities of teachers to those situations where teachers work autonomously.

Questions such as "How are we more like one than the other?" and "What do we need from each other in order to develop as a professional community?" enabled the staff to use the Double Bubble Map as a reflective tool to facilitate critical thinking, group learning and systemic change.

Figure 2-12
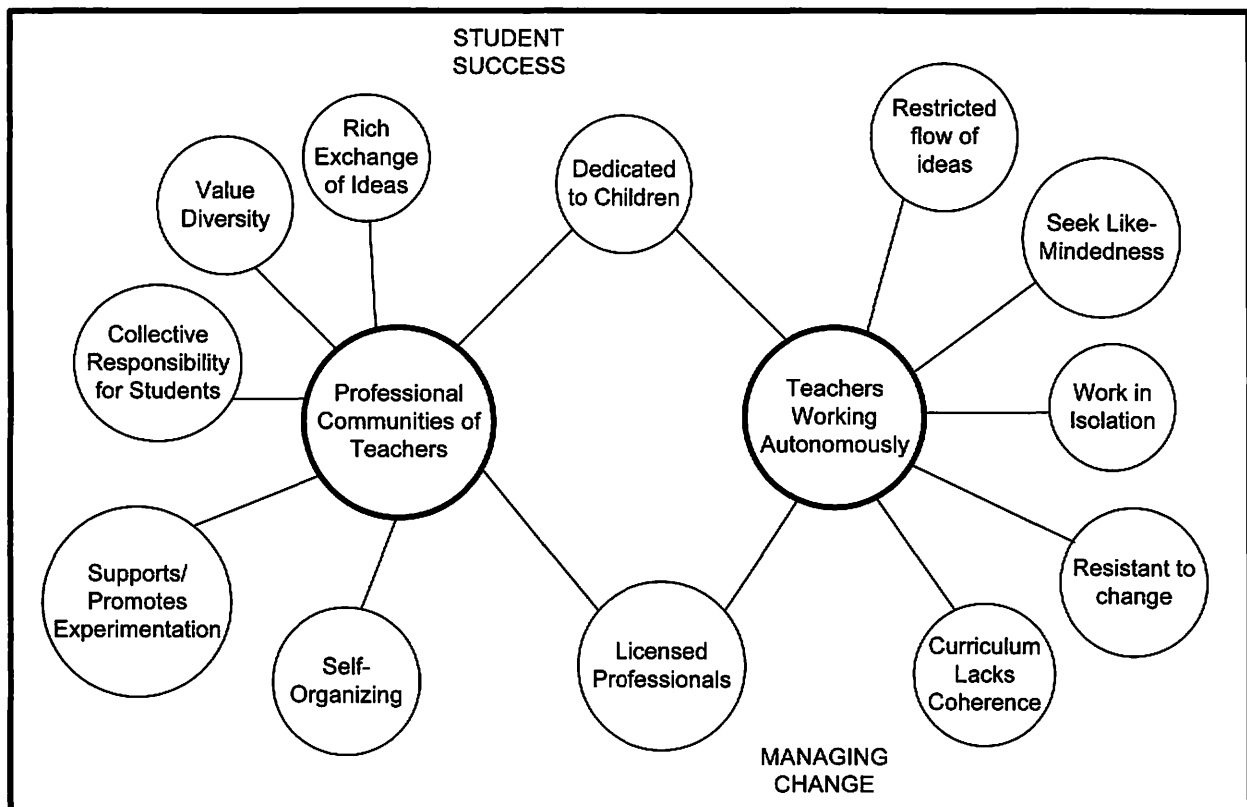
Double Bubble Map for Comparing and Contrasting

In this example, the Frame was used to maintain a focus on the core of the school's mission—to promote student success. In addition, the principal and staff were interested in becoming more adept in managing change. This was included in the Frame so that the qualities could be discussed in relation to these two primary concerns. "How does being a professional community of teachers enable us to more effectively promote student success?" was one of the guiding questions used for this conversation.

Discussion

The process of formal evaluation depends upon establishing key attributes or qualities as criteria for valuing things and making decisions. The Bubble Map and Double Bubble Map support the identification of criteria. Deciding what to include in the Map is an essential part of developing personal and group insight into what is considered valuable and important by all participants. The Frame guides people to clarify the frame(s) of reference that a person or organization is using for evaluating and judging the attributes.

Student Examples

The process of comparing and contrasting is fundamental to how students make meaningful connections and formulate reasoned opinions about ideas, issues and topics. The story <u>Stellaluna</u> and the use of the Double Bubble Map shown on the next page shows how younger students may develop their understanding of the similarities and differences between birds and bats while also engaging with the various elements of the story. This example, taken from the Thinking Maps resource book, <u>Show Your Thinking</u>, is one of several Thinking Maps students can use to deepen their understanding of a variety of concepts in this particular story.

As students advance into the secondary level, the amount and complexity of information they must process dramatically increases. Students are aided in this challenge by using multiple Thinking Maps to visually represent the thinking processes and patterns of the content found in the texts they are reading. Doing this effectively and efficiently greatly influences both their memory of information and the understanding of the concepts. The secondary example is an application of the Double Bubble Map to comparing systems in the body. This student work, completed and saved as notes on Thinking Maps Software, was one of nearly 30 other Thinking Maps developed by just one student over a semester to synthesize information contained across all of the chapters of her high school biology test.

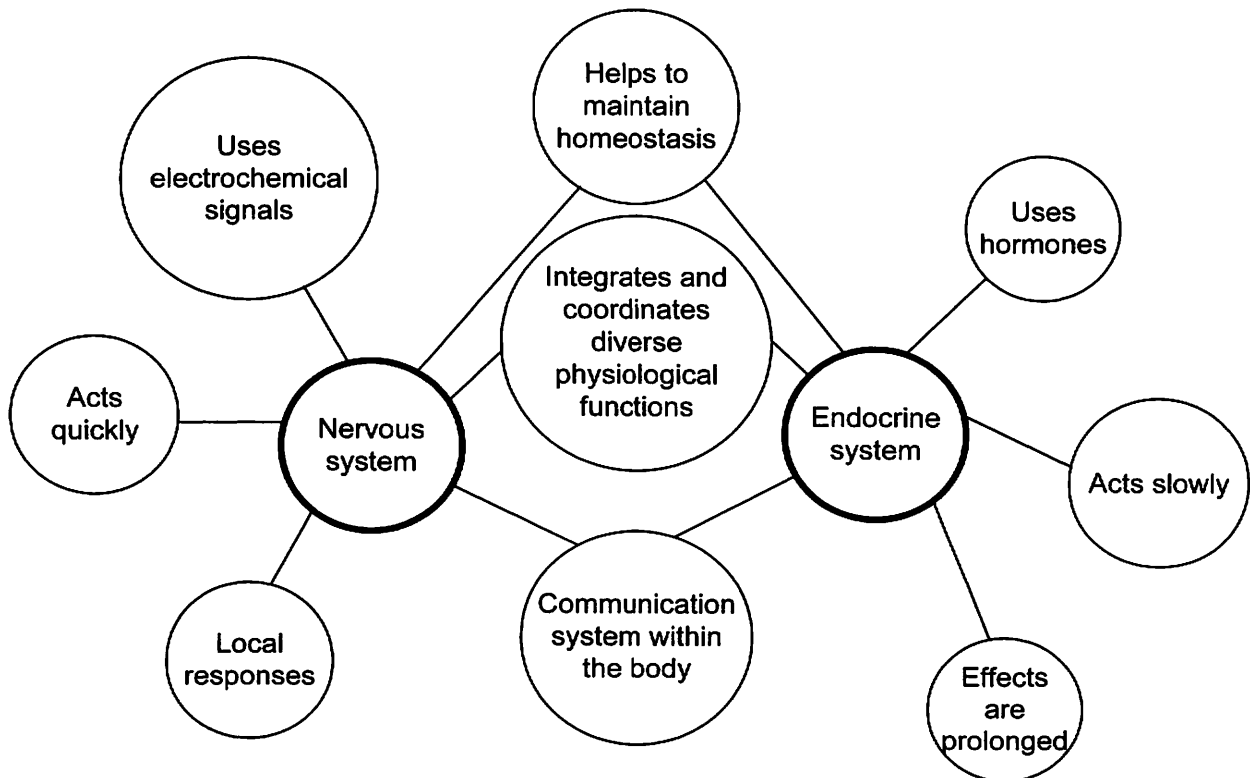# Double Bubble Map for Comparing and Contrasting

Figure 2-13
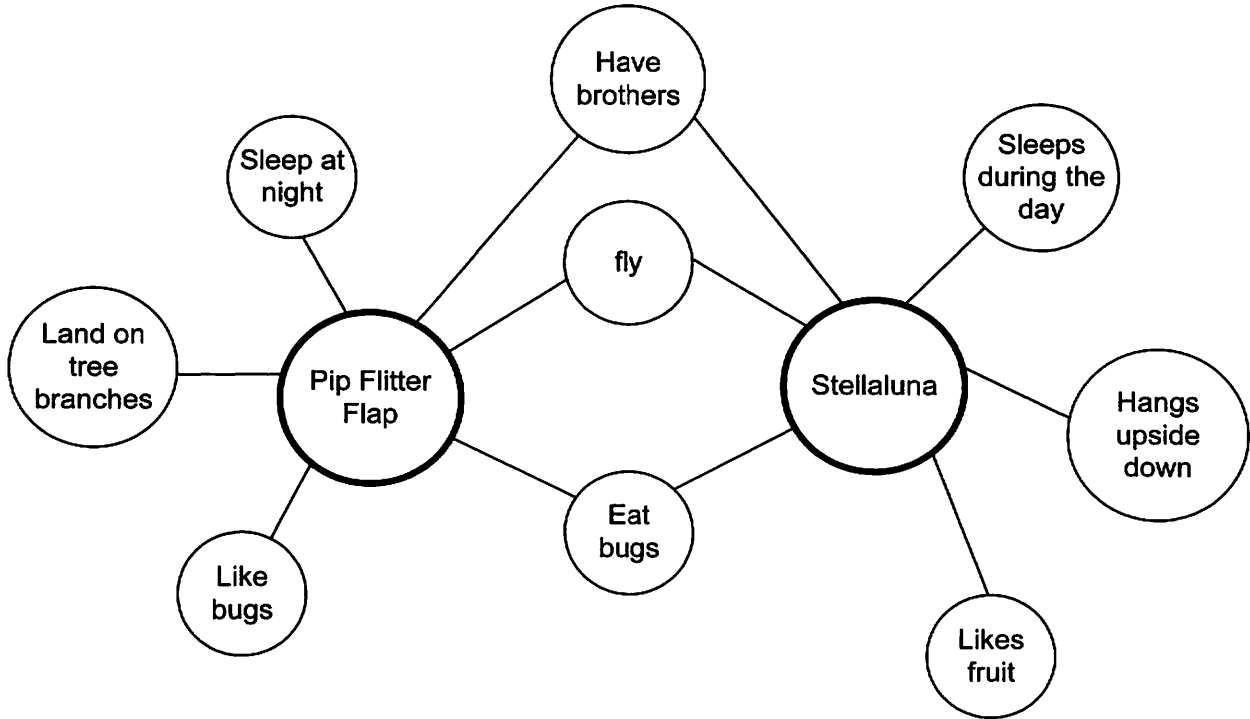
Figure 2-14

# Tree Map for Classifying and Grouping Ideas

Thinking Process
Classifying **is the process of sorting things into** categories
or groups **and creating new categories, often according to
common qualities.**

Thinking Map
The Tree Map is used for **classifying** things and ideas. On the top line
write the category name, on the second level of lines write the subcate-
gories, and below each subcategory write the specific members.

Figure 2-15
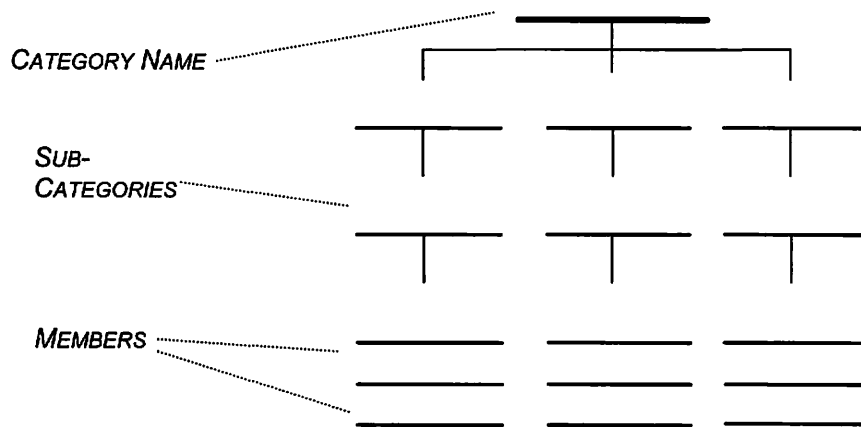
Questioning Using the Tree Map
What name would we give to this group of ideas?
How could this information be categorized?
What other kinds of information go into these categories?
What are the subcategories or subgroups in this information?
What are the specific details ?
Is there information that would be included within multiple categories?
What is your point of view (use the Frame) for seeing the category structure in this
way?
Is there another way to classify this information?

Tree Map for Classifying and Grouping Ideas

Example

In this example, members of a school's Parent Involvement Council identified key topics of interest and used the Tree Map to organize them into categories. Use of the Tree Map helped parents define the areas of greatest importance to them and enabled them to make meaningful connections with each other. The Tree Map assisted the group in planning programs and identifying additional topics in these categories for future discussions. If necessary, the Tree Map could easily be expanded to include new categories as they developed.

Figure 2-16

	Guidance Counselor	**Parent Involvement Programs** — **Experienced Parent**	

Curriculum	Child Development	Health and Safety	Parenting
Parent of Only Child			
Implications of Federal/State/Local Assessment Programs	Peer relationships in early adolescents	Personal safety issues for young children	Maintaining communication while setting limits
Standards-Based Math Program	Key developmental challenges of each age-cognitive and social	Maturational Milestones	**Teacher** — Positive discipline strategies
Single Parent	What's fair? A fourth grader's perspective	**Administrator**	Family traditions and routines

Tree Map for Classifying and Grouping Ideas

The Frame around the Tree Map helped the group appreciate the multiple contexts and experiences that people brought to this discussion. The different family structures represented in the group added breadth and depth to each person's understanding of the topics under consideration.

Discussion

Classifying and grouping ideas into a Tree Map is an individual or group decision-making process with no inherent right or wrong way to do it. While all ideas, objects, etc. have attributes, they are not always evident to everyone nor are the same ones equally important to different people. The Frame around the Tree Map challenges us to ask the question: Why did you (I) classify things in this way? Such questions facilitate creative and analytical thinking and contribute to the Tree Map's dynamic quality. The use of the Tree Map can be expanded and deepen the way we view things. We are able to see connections within categories and across them, as well.

Student Examples

The use of the Tree Map provides students with an opportunity to visually categorize information. At the same time, it challenges students to make conscious decisions about what information should be grouped together, the name to be given these categories, and the justification for their choices. Depending on the Frame of Reference being used, the content of the categories and the categories themselves may vary.

In the elementary example, (see Thinking Maps resource, Map Your Thinking, for this and other examples), the Tree Map was used by a class to generate additional action words associated with a lead word in each category. The students were engaged in discussion about when the use of each would be most appropriate. As a follow-up activity, the teacher asked groups of students to take a category of words and use a Flow Map to place them in order of intensity.

As shown in the secondary example of the Tree Map, in preparation for a report about Frederick Douglass, a student chose to narrow her focus to a particular aspect of Douglass' life. The Tree Map was used by the student to prioritize and organize details about each category as the student researched Douglass' life. These details were further developed into a piece of expository writing by using a Flow Map to sequence the paragraphs of the report. The final written report on Douglass included an attached Bubble Map describing his character traits, the Tree Map as shown, and the Flow Map showing the sequence of ideas.

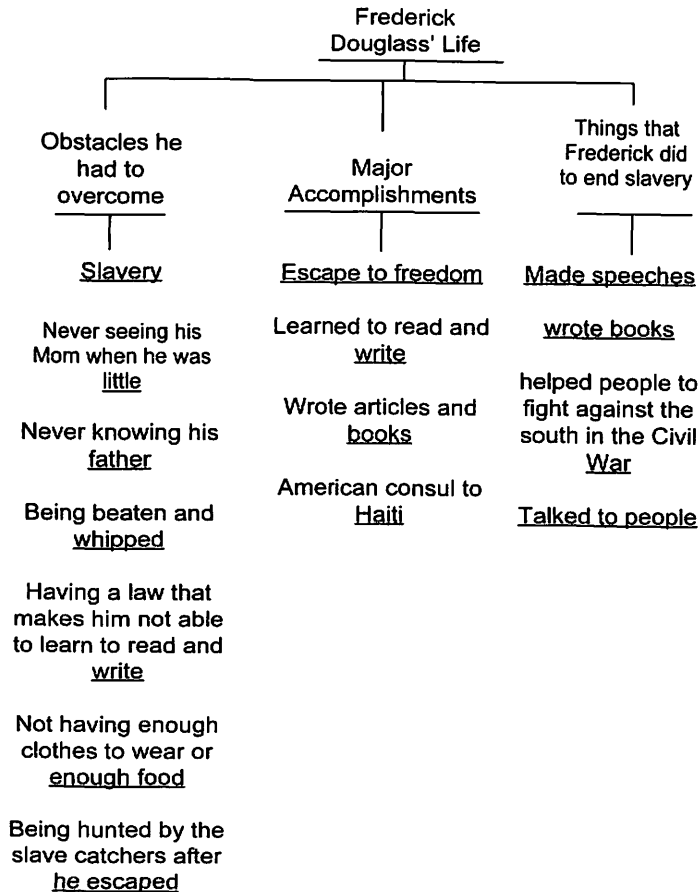# Tree Map for Classifying and Grouping Ideas

Figure 2-17

Action Words

throw	hurry	sleep	hit	chew
toss	scurry	mop	strike	munch
heave	dash	slumber	swat	crunch
pitch	speed	doze	punch	nibble
hurl	rush	snooze	whack	champ
sling	race	hibernate	sock	_____
jerk	sprint	sloth	_____	_____
bnce	zoom	torpor	_____	_____
discharge	flee	idleness	_____	_____

Figure 2-18

Frederick Douglass' Life

Obstacles he had to overcome	Major Accomplishments	Things that Frederick did to end slavery
Slavery	Escape to freedom	Made speeches
Never seeing his Mom when he was little	Learned to read and write	wrote books
Never knowing his father	Wrote articles and books	helped people to fight against the south in the Civil War
Being beaten and whipped	American consul to Haiti	Talked to people
Having a law that makes him not able to learn to read and write		
Not having enough clothes to wear or enough food		
Being hunted by the slave catchers after he escaped		

Brace Map for Whole-Part Relationships

Thinking Process

The common terms used to define spatial relationships are "whole to part" and/or "part-whole" reasoning. Whole- to-part reasoning is the process of identifying the relationship between a whole **physical** object and its **parts**.

Thinking Map

The Brace Map is used to analyze **physical objects**. On the line to the left, write the name of the whole object. On the lines within the first brace to the right, write the major parts of the object, then follow within the next set of braces with the subparts of each major part.

Figure 2-19

WHOLE OBJECT

MAJOR PARTS

SUBPARTS
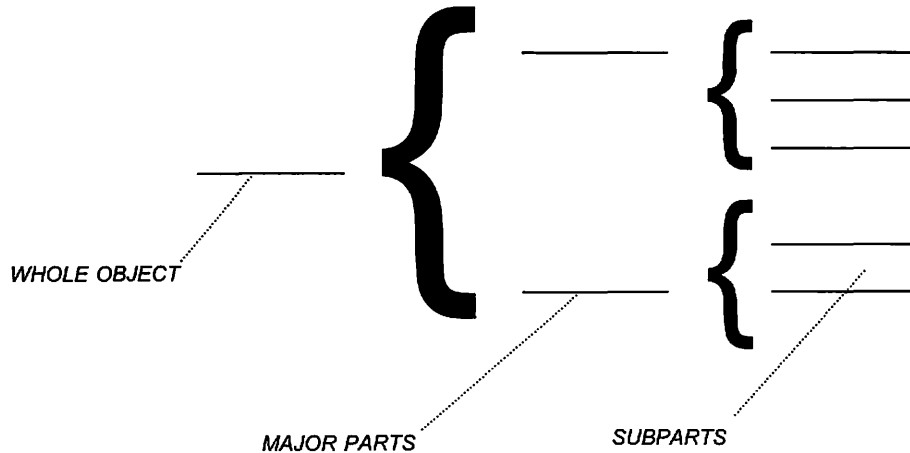
> **Note:** The Brace Map is used for analyzing functional, *physical* relationships. Here are some examples: a safety study of a playground design, the analysis of the layout of a school building, an equipment inventory by location in the rooms throughout a school, and the evaluation of a building

Questioning Using the Brace Map

What is the name of the whole object?

What are the major physical parts of the object?

What are the subparts of each major part (if any)?

How did you decide what were the major parts and what were the subparts? What is this object a part of?

Is there any other way to see the part-whole relationships of this object?

Brace Map for Whole-Part Relationships

Example

As shown below, a school principal and custodial staff used a Brace Map to define the major parts and subparts of the school's physical plant. Identifying the components of the building in this way enabled them to develop a comprehensive daily, weekly, and annual maintenance program for their facility.

Figure 2-20
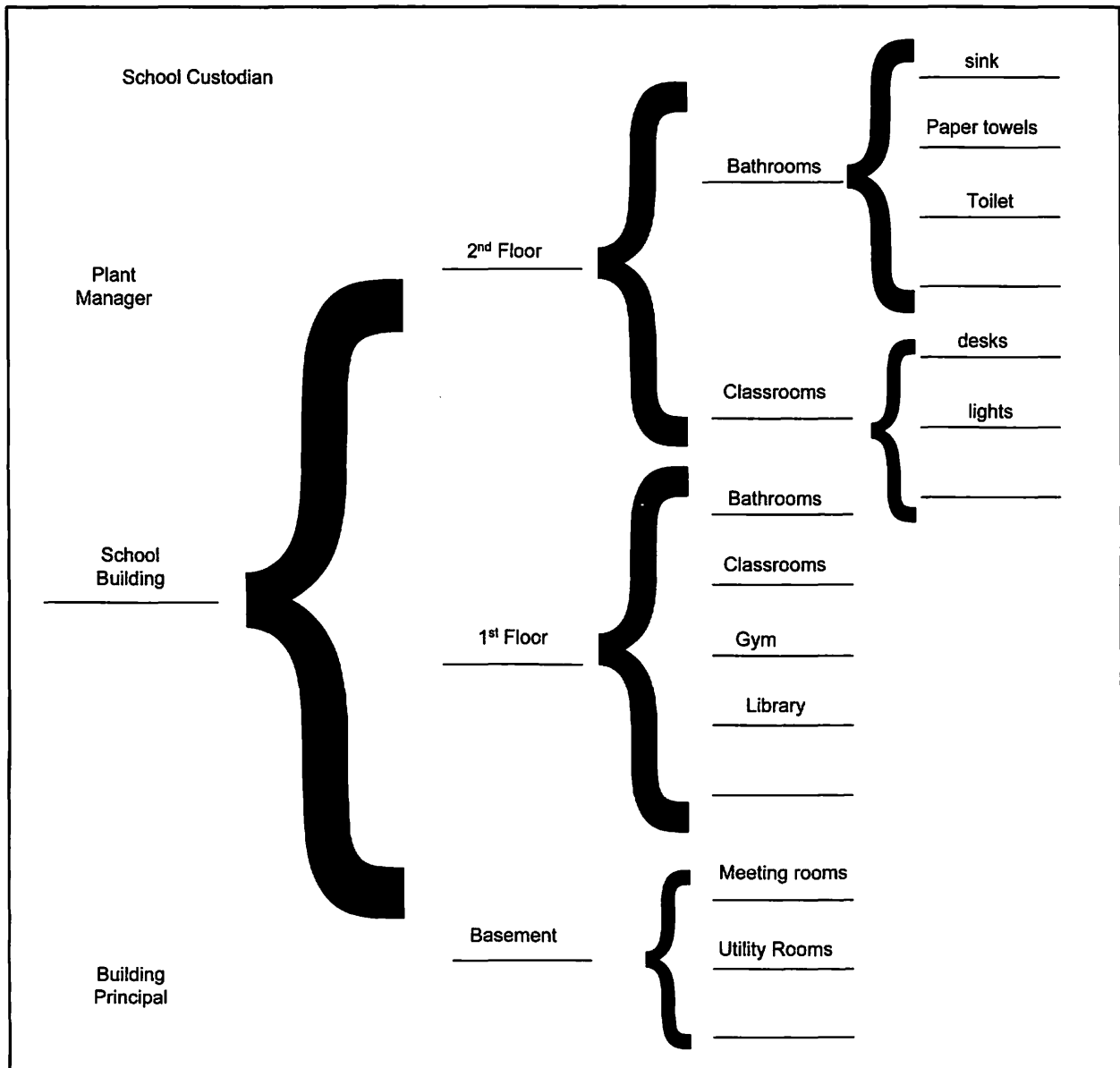
Brace Map for Whole-Part Relationships

Notice the difference between the Brace Map example on the last page and the Tree Map example on the previous pages. These Maps are based on **fundamentally** different thinking processes. The Brace Map is used for identifying the concrete part-whole physical relationships of an object. The Tree Map is used for abstract categorization of groups of things.

Discussion

Using the Frame with the Brace Map asks us to go beyond the simple representation of the physical relationships of the component parts of an object. We become interested in the purpose of analyzing these relationships. How we conceptualize these parts and the implications this has for actions is greatly influenced by the point of view we hold. Including multiple perspectives in the Frame reminds us in a powerful way that concrete objects and the relationships of their component parts exist in the world in a dynamic form.

Student Example

The Brace Map can be used by students to illustrate the physical relationships of whole-to-parts (or parts-to-whole) of an object. This can provide the basis for further analysis, enabling students to develop more precise comparisons to other objects and to understand how the object may be affected if any of its parts are damaged or changed.

The first example shows a kindergarten student's understanding of the structure of a flower. From this Brace Map, the teacher has many opportunities to probe and extend this student's understanding by asking him, for example, about the function of the different parts, the relationship of these parts to those of other organisms (such as the ecosystem of a garden), and the impact of the whole world should any of these parts be damaged.

In the secondary example, at a far more advanced level, but still employing the same thinking process, a high school student used Thinking Maps Software to develop a Brace Map for analyzing the physical structure of a muscle. In both examples, the students are gathering information from objects and texts, representing the anatomical relationships visually, and then using this as a basis for further analysis and developing deeper insights.

Brace Map for Whole-Part Relationships

Figure 2-21

Parts of a flower

Figure 2-22

Muscle
- Tendon
- Connective Tissue sheath
- Muscle fasciculi
  - Axon of motor neuron
  - Blood vessels
  - Muscle fiber
    - Sarcolemma-cell membrane
    - nuclei
    - Sarcolasmic reticulum-folded to store calcium
    - mitochondria
    - t-tubules
    - myofibris
      - Myosin (thick myofilaments)
      - actin (thin myofilaments)
        - Troponin
        - tropomyosin
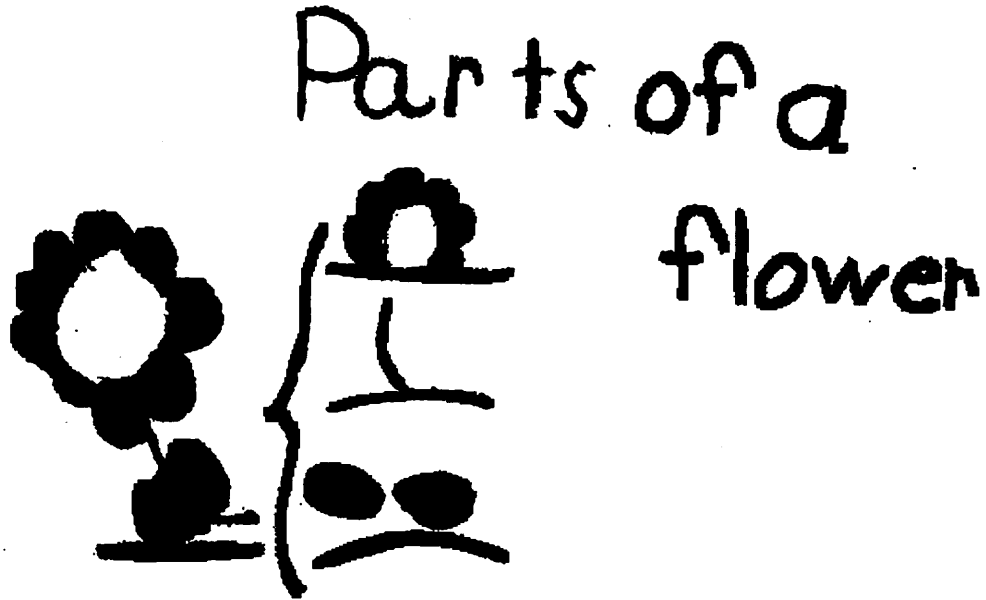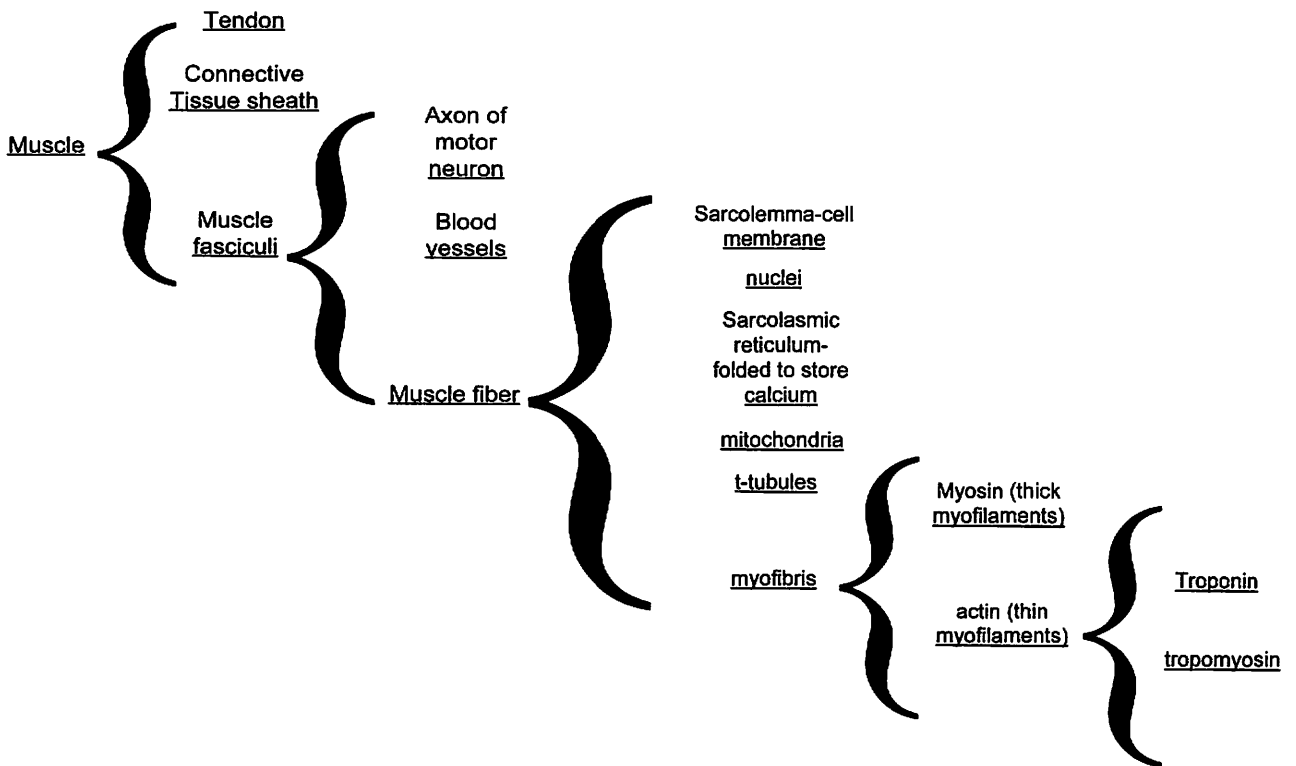
Flow Map for Sequencing and Ordering

Thinking Process

Sequencing is the process of identifying the relationships between **stages and substages of an event** (or order of numbers, operations, steps, etc.).

Thinking Map

The Flow Map is used for **sequencing and ordering information**. In the outside rectangle write the name for the event, or sequence. In the larger rectangles—flowing from left to right—write in the major stages of the event. In the smaller rectangles below, write in the substages of each major stage.

Figure 2-23
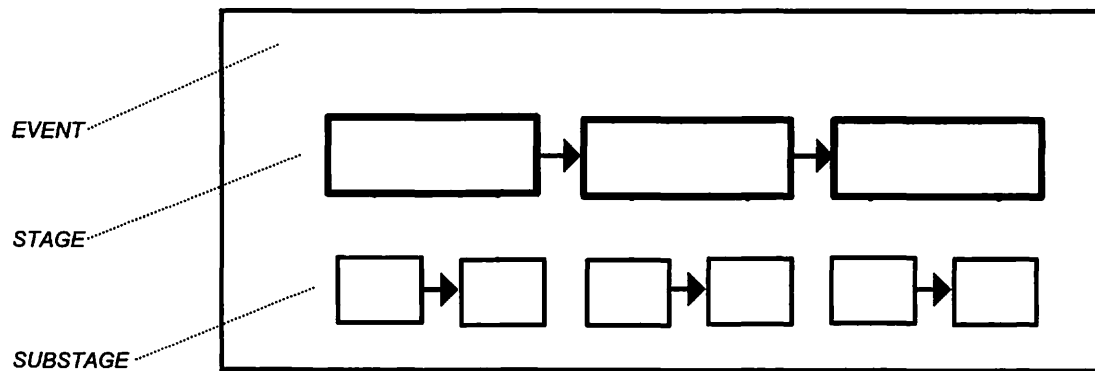
Questioning Using the Flow Map

What is the name of the entire event or sequence?
What are the stages of each event or phase?
What are the substages of the event?
Is there another way to understand the relationships between the stages and substages?
What larger events might come before or after the event you are investigating?

Flow Map for Sequencing and Ordering

Example

This Flow Map was developed by a student and a principal to reconstruct the sequence of events that led the student to be sent to the office. The process of working together on the Flow Map helped to diffuse a potentially contentious situation by connecting the student and principal to a common purpose. Guided by the questions, the student was able to give visual and verbal form to his experience, validating it and allowing it to be reflected upon.

Figure 2-24

Confusion   Routine

I couldn't sit where I usually sat → A teacher asked us if we would move → I asked "Why?" She said the schedule was changed. I was confused. → She told us why we had to move

I didn't move but my friends did → I was getting frustrated. But I moved by crawling under the table. → Money fell out of my pocket

The teacher asked if she could help me → I said "I don't want your crappy help." → Another teacher sent me to the office

Frustration   Anger

Flow Map for Sequencing and Ordering

By including the student's feelings in the Frame, the principal was able to coach the student on a deeper level. The student could easily identify what he might have done differently in the situation. What was more important to the principal, however, was to help the student identify the feelings that governed his behavior so that he would learn to successfully mediate those feelings in situations in which they could arise.

Discussion

The sequencing of events is like the telling of a story, real or imagined. In the process of doing so we identify the important stages and substages, the ones actually experienced or those anticipated. As a result, we are better able to see patterns, identify critical events and look beyond the surface of what happens. With foresight or hindsight, the Flow Map enables us to monitor the unfolding of a plan, forecast its impact, make adjustments as necessary and examine the implications of how events actually developed.

Student Examples

The elementary student application demonstrates the use of a Flow Map for showing the sequence of steps used to determine the solution to a math problem. Notice how the Flow Map provides the teacher with an immediate assessment window into the student's thinking and reveals the degree to which the student has understood the problem, identified the important information, and applied appropriate mathematical strategies to arrive at a solution. Such a rendering by the student allows both the teacher and student to see and correct any misconceptions and highlight novel and efficient strategies for solving the problem. For a complete representation of all the maps linking this particular application to math problem-solving, see the Thinking Maps resource, Map Your Thinking.

Whether recounting the major events of a historical period, retelling the events of a story, or representing the steps in a process, students are always deciding which details to include as major events and which to include as sub-stages or incidental information. In the secondary example on the next page, the student created a Flow Map of the major events of World War II. To extend this learning activity, the students could be asked to create an analogy (using a Bridge Map) between each major stage of the war and other wars the students have studied.

Flow Map for Sequencing and Ordering

Figure 2-25

| Determine how much each of Alex's items are worth:

hamburger=$2.00
French Fries=$1.50
drink=$1.00 | → | Add together the money that Alex spent:
$2.00 + $1.50 + $1.00 = $4.50 | → | Subtract this total from $5.00
($5.00-$4.50=) | → | The difference is $.50 |

Figure 2-26

W WWII

1939 — Germany invaded Poland → England and France Allies declared war on Germany Japan and Italy with Germany from Poland → Germany conquers Poland, Denmark, January, Belgium → 1940 Germany attacks France France Surrenders

1941 — Germany attack Russia → 1941 Japan bombs Pearl Harbor → 1942 British began driving Germany out of Africa → Russia attacks Germany

1944 — Italy is invaded by the Allies → Allies free France from Germany → Germany generals try to kill Hitler → March 1945 Anne Frank dies

April 1945 — Russia and US invade Germany Hitler and Eva commit suicide → May 1945 Allies rescue concentration Camp survivors → US bombs Hiroshima and Nagasaki

Multi-Flow Map for Cause-Effect Relationships

Thinking Process
The process of sequencing is extended by identifying the interrelated **causes and effects** of events.

Thinking Map
The Multi-Flow Map is used for **showing and analyzing cause and effect relationships**. In the center rectangle, write in an important event that occurred. On the left side of the event, write in the causes of the event, and on the right side, write in the effects of the event. As you identify more causes and effects, add them to the Map. If you are studying a system, you will find that there are effects in the system that, in turn, influence initial causes. This circular cause and effect relationship is called a *feedback loop*.

Figure 2-27

Event
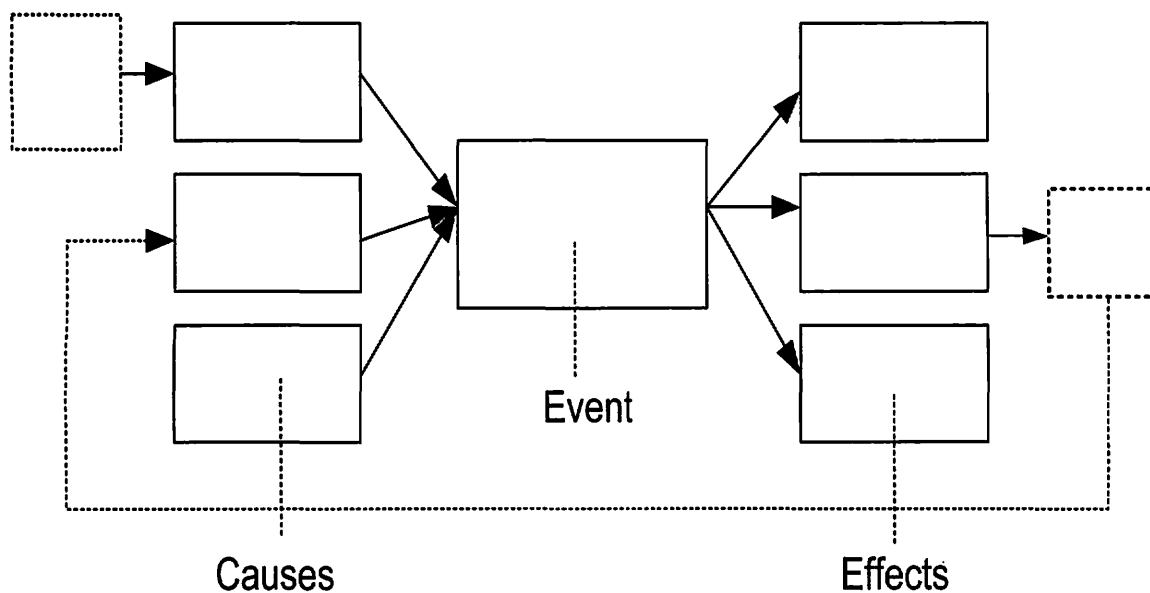
Causes   Effects

Questioning Using the Multi-Flow Map
What are the causes and effects of this event?
Which relationships do you see between the causes and effects?
Which of the causes and effects are most important?
What are the *feedback* influences on this system?
What are the short- and long-term effects that you might predict will happen?

Multi-Flow Map for Cause-Effect Relationships

Example

Here is an example of a Multi-Flow Map developed by a group of teachers who were considering significant changes in how they organized their school. In response to the compelling needs of their students and their own desire to work with students in a deeper way, these teachers used a Multi-Flow Map to identify the potential effects on their work of staying with the same students for two years.

Figure 2-28
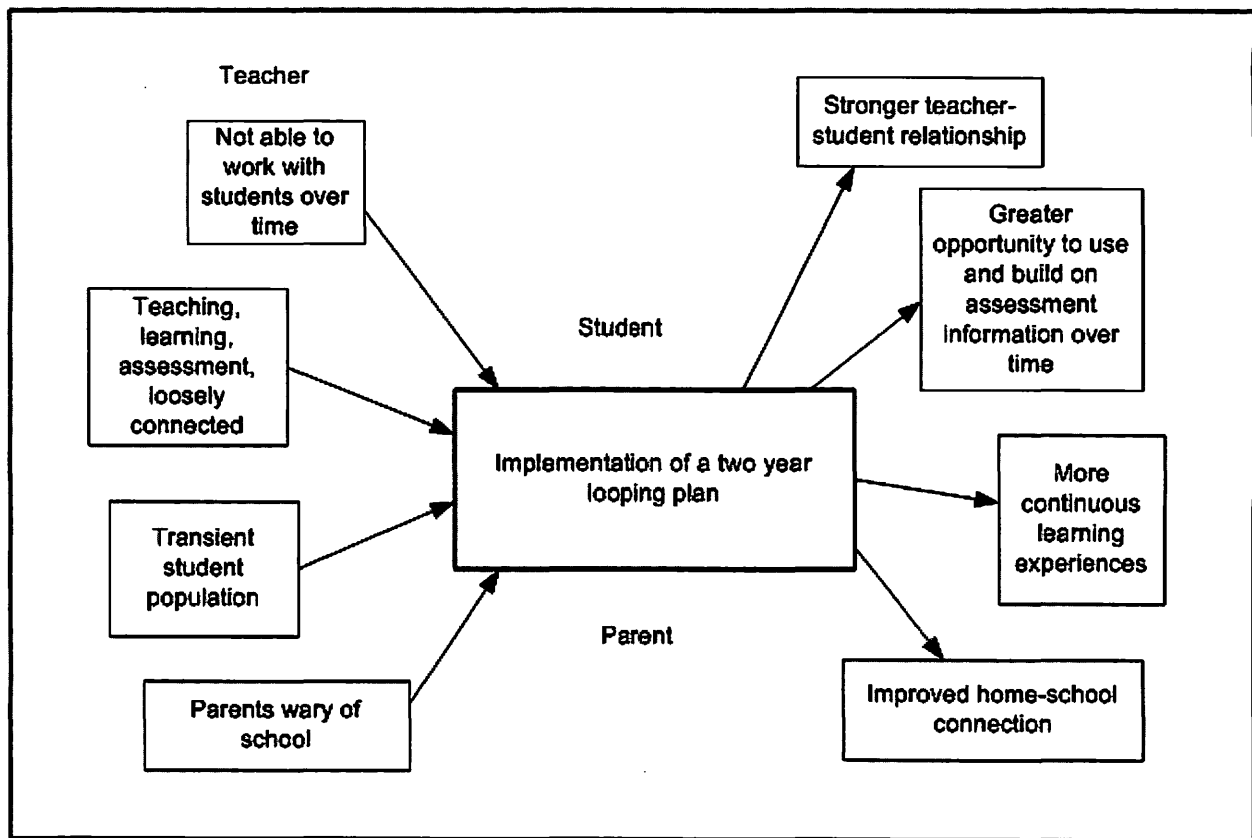
Multi-Flow Map for Cause-Effect Relationships

Notice that each of the predicted outcomes of this event, looping, could in turn be viewed as an event itself and analyzed further in a similar way. The Frame asks people to consider this information from multiple points of view—student, parent, teacher. The Frame could also be used to include the desired outcome, which is influencing how people are thinking about these causes and effects.

Discussion
The Multi-Flow Map is a key tool for analyzing past and current events and for predicting and analyzing outcomes, positive or negative, when considering possible solutions to a problem. The ability to anticipate and analyze unintended, as well as expected, consequences of particular actions or behaviors is a critical component of successful change processes. The Multi-Flow Map makes it possible to convey the underlying complexity of dynamic systems and brings to light the pitfalls and possibilities that exist within them.

Student Examples
In the elementary example of the Multi-Flow Map, notice how the causes and effects of "Hurricane Emily" contain information that is specific to this event and drawn from the prior knowledge of the student. The addition of the Frame of Reference to this map would help the reader and the teacher identify the sources the student used to generate this information. The student's responses could be further expanded by asking the student to use the Frame of Reference of someone living in the center of the storm, or from the perspective of someone in a rural area, or someone living alone. In this way, the student is challenged to draw upon additional background knowledge, make inferences, and consider effects that are both observable and unseen.

The secondary example demonstrates the use of the Multi-Flow Map to understand the causes and effects of historical developments by identifying important ideas from the text. Whether using fiction or non-fiction, successful readers often need to comprehend with a purpose in mind. In this instance, the reader recognized the text structure and thinking pattern of cause and effect in the text and then selected the appropriate Thinking Map to record the key information.

In both examples, notice that there is not necessarily a one-to-one correspondence between the causes and effects. Often multiple causes blend to create effects, and in turn create a "ripple effect," leading students and teachers to extend the Multi-Flow Map beyond immediate to long-term effects.

Multi-Flow Map for Cause-Effect Relationships

Figure 2-29

Causes (left, pointing to Hurricane Emily):
- Strong winds
- Air pressure
- Steaming ocean
- warm air/cold air meet
- forms near equator
- momentum builds lots w/ travel

Center: Hurricane Emily

Effects (right):
- beach erosion
- evacuations
- open shelters
- drownings death
- electricity loss
- School is out
- $ loss
- houses destroyed
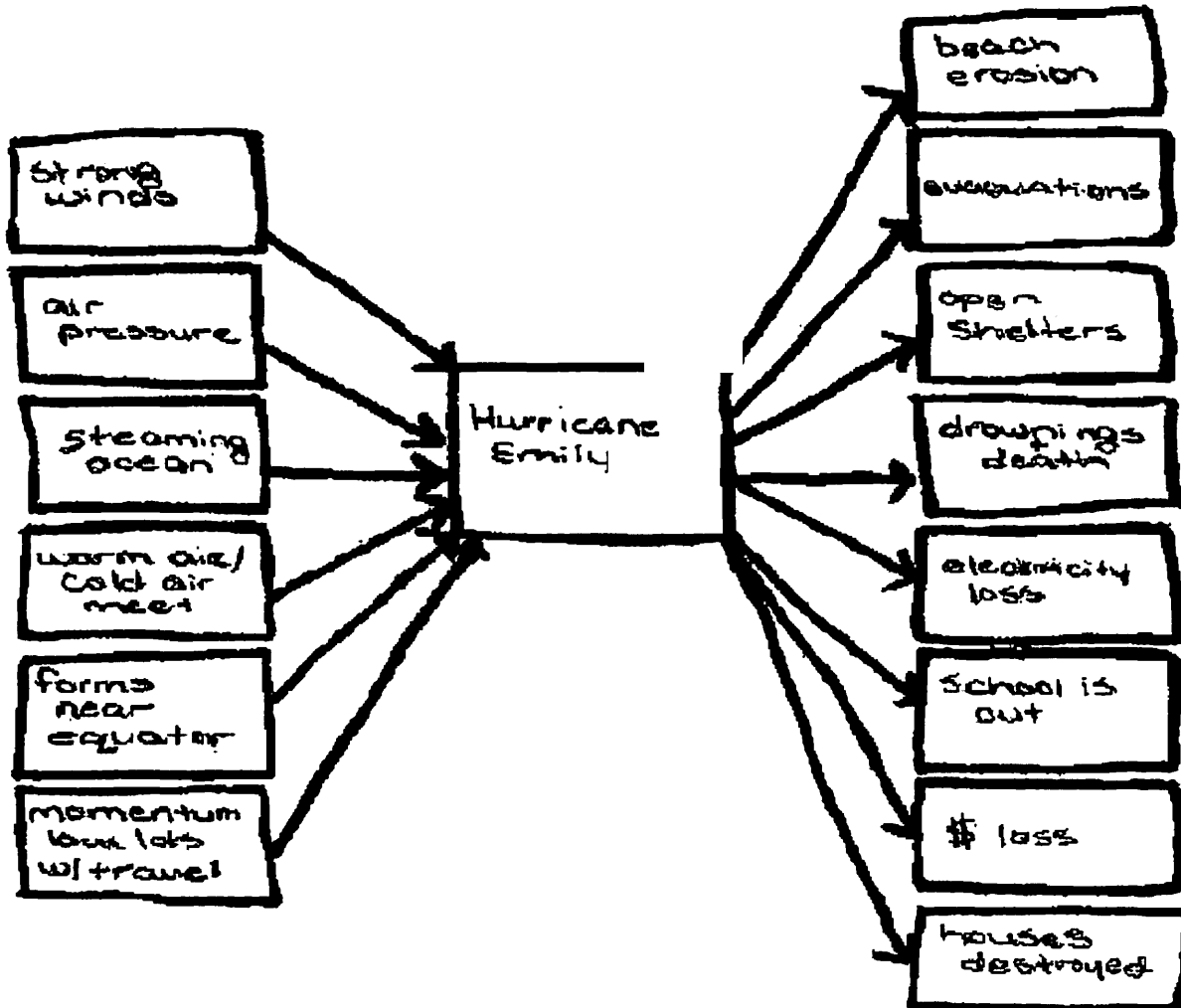
Bridge Map for Seeing Analogies

Thinking Process
Seeing analogies is the process of identifying **similarities between relationships**.

Thinking Map
The Bridge Map gives people a tool for applying the process of seeing analogies. On the line to the far left, write in the **relating factor**. *The relating factor is the similar phrase that fits both sides of an analogy.* On the top and bottom of the left side of the bridge, write in the first pair of things that have this relationship. On the right side of the bridge, write in the second pair of things that have the same relationship. The line of the bridge represents the relating factor that is "bridged over" from one side of the analogy to the other. As a check for understanding, write the analogy as a complete sentence.

Figure 2-31

RELATING FACTOR   FIRST PAIR   SECOND PAIR
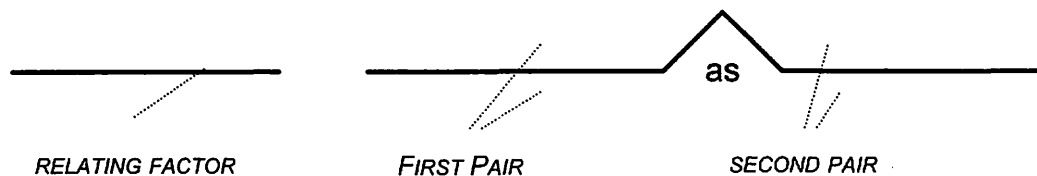
Questioning Using the Bridge Map
What is the similar relationship (relating factor) between these two pairs?
Because not all analogous relationships are exactly the same, how are the bridged pairs similar and different?
What other pairs of relationships have the same relating factor?
Are the two relationships from within the same content area, or from different fields of study?
From whose frame of reference was this analogy created?
Does this affect the meaning of the analogy?
In what ways is this analogy a foundation for a guiding metaphor?

Bridge Map for Seeing Analogies

Example

For one school's faculty members, the connection between a strong classroom climate and thoughtful student behavior was an effective way to begin to think about the relationship between their own behaviors and the climate of the school in general. Wanting to extend their thinking further, they then used the connection between a harmonious ecosystem and thriving plant and animal life to more deeply probe and understand the dynamics within their own school community. The Bridge Map shown below portrays how the faculty members used the different relationships to promote and deepen their discussion about qualities of a school's climate necessary to support their own thoughtful behavior.

Figure 2-32

School as a Home for the Mind	Success for all Students	Educational Leadership	
	Harmonious	Strong School	Strong Classroom
Support(s)	Ecosystems	Climate	Climate
Relating Factor	Thriving Plant and Animal Life	Thoughtful Teacher Behavior	Thoughtful Student Behavior

(Bridge Map: Harmonious Ecosystems **as** Strong School Climate **as** Strong Classroom Climate)
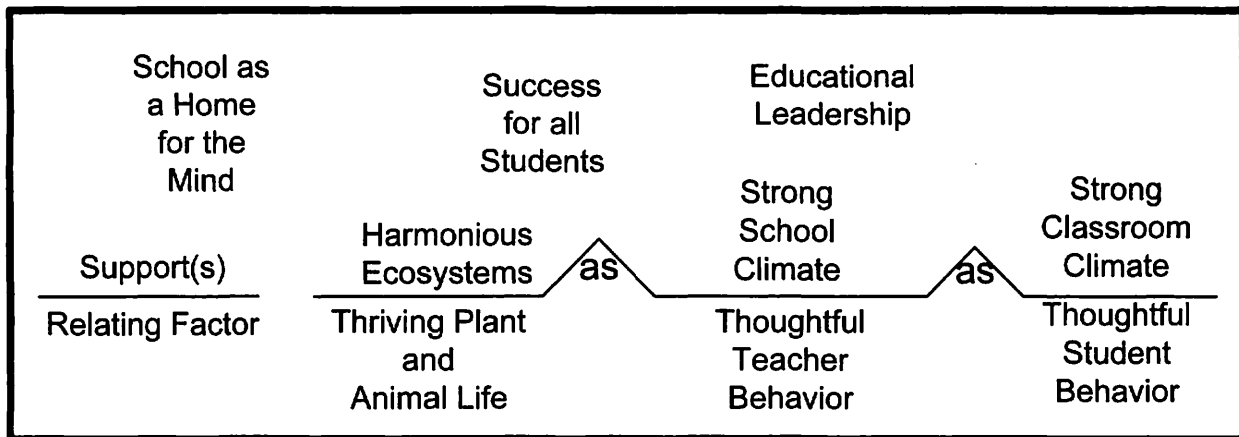
How does a strong school climate support thoughtful teacher behavior? How are school climates and classroom climates related? How are they the same? Different? How is a school like an ecosystem? What are the key elements of a strong school climate? In what ways are they the same or different from those necessary to sustain a harmonious ecosystem?

Each of these questions has the potential to lead the faculty members to greater insight into their internal dynamics and guide them in pursuing constructive changes to make the school climate meet their desired goals.

Bridge Map for Seeing Analogies

To deepen their consideration of this topic, the faculty members included Art Costa's concept of the school as a "home for the mind" in the Frame. Together with success for all students, educational leadership and the role of the school board, these four frames of reference helped the faculty to generate questions that would ground their thinking in what was most important to them. By discussing how a school can be a "home for the mind" for both teachers and students, the faculty was able to more clearly understand and articulate the relationship between school and classroom climate and students' success. Additionally, the faculty was asked to develop other relationships from different contexts to challenge the conventions of their thinking and expand the boundaries of what's possible for their school community.

Discussion
Analogies and metaphors often inspire the creation of meaning in ways that ordinary language cannot. By bridging a concept from one context to another, sometimes familiar and sometimes foreign or even playful thinking can be unlocked and ways of seeing expanded. The Bridge Map is not only an effective tool for surfacing these metaphors, but in doing so it becomes a guide for our decision making and actions, as well.

Student Examples
The use of the Bridge Map in the elementary student example highlights its effectiveness in drawing attention to and reinforcing the relationships and patterns that are the foundation of much of mathematics. Notice that the relating factor, *is the same amount as*, is the essential element for creating and understanding analogies. Imagine the teacher introducing the appropriate mathematical term "Commutative Property" as the students demonstrated their understanding of it through the use of the Bridge Map. As a challenge to their understanding, the teacher could then ask the students to continue the Bridge Map, this time identifying pairs that share the underlying principal of the Commutative Property, but found outside of mathematics.

In the secondary student example, the Bridge Map was used by students to identify ways Shakespeare symbolically represented character traits and foreshadowed actions by the characters. In each of the Bridge Maps shown in this example, students could continue to analyze other characters in the story or include similar connections with characters from other stories or people from real life.

In each of the two examples, the Bridge Map heightens the students' attention to details, as well as the literal and figurative meanings they possess.

Bridge Map for Seeing Analogies

Figure 2-33
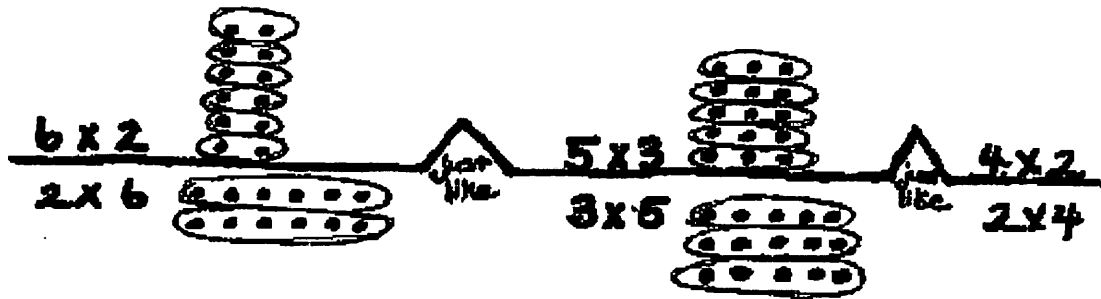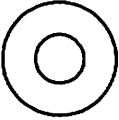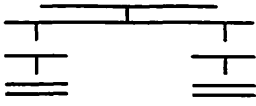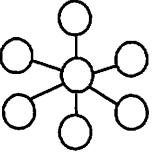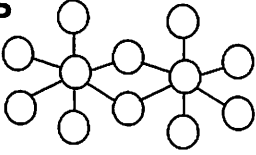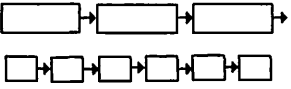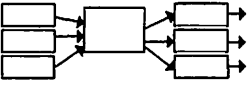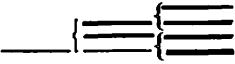
$$\frac{6 \times 2}{2 \times 6} \quad \text{just like} \quad \frac{5 \times 3}{3 \times 5} \quad \text{like} \quad \frac{4 \times 2}{2 \times 4}$$

Relating Factor: Is the same amount

6×2 is the same amount as 2×6, just like
5×3 is the same amount as 3×5, just like
4×2 is the same amount as 2×4.

Figure 2-34

Were a sign of anger for	Fiery eyes	Pale cheeks	?
Relating factor	Cicero	Calpurnia	?

(as) (as)

Was a tragic flaw of	Ego	Gullibility	?
Relating Factor	Caesar	Brutus	?

(as) (as)
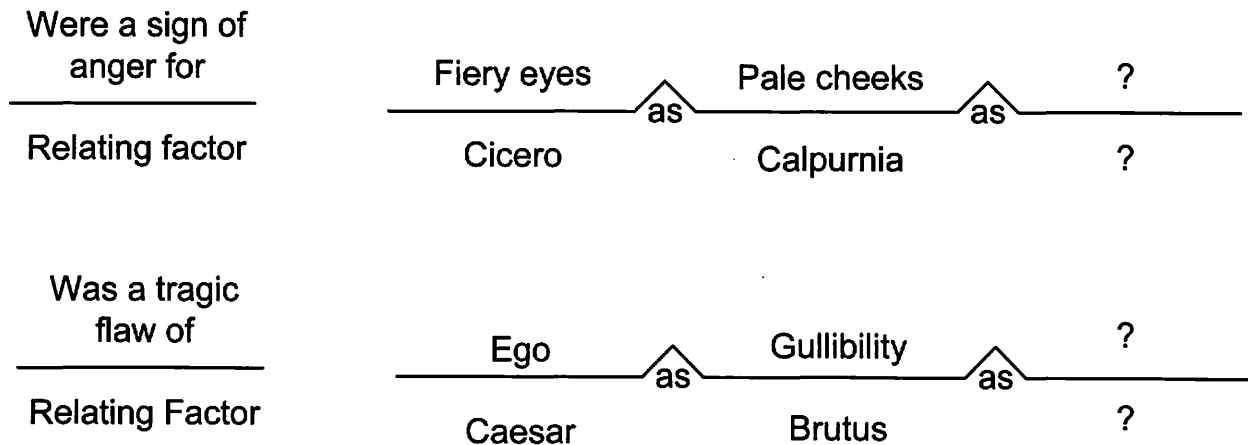
Essential Questions for Problem Solving with Thinking Maps

CIRCLE MAP How would you define this problem?	**TREE MAP** How would you group the information about this problem?
BUBBLE MAP How could we describe this problem?	**DOUBLE BUBBLE MAP** How does this problem compare with others?
FLOW MAP What is the sequence of events or steps taken?	**MULTI-FLOW MAP** What are the causes and effects of this problem?
BRACE MAP What is the whole object and what are the parts?	**BRIDGE MAP** Is there an analogy or metaphor?

Frame Questions: *What beliefs, assumptions, values, experiences, etc., are influencing our thinking? How would others view this problem?*

Problem-Solving with Thinking Maps

STAGES IN THE PROCESS	QUESTIONS GUIDING INQUIRY	THINKING MAPS

1. Define Problem

Avoiding "premature clarity" is a critical element in any successful problem-solving process. Taking time to surface the purpose, create the context and represent the multiple frames of reference is essential to defining the problem.

- What is the context of this problem? (Circle Map, Frame)
- How would we describe its attributes? (Bubble Map)
- What is our desired state? (Multi-Flow Map)
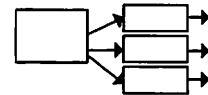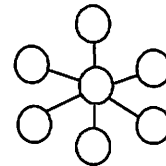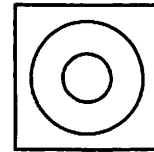
2. Collect, Organize and Analyze Data

Once the required data is determined, collected and organized, it needs to be analyzed and discussed to identify root causes and develop shared understandings. Question posing is a key aspect of this stage.

- How would we organize the data (inductive and deductive classification)? (Tree Map)
- What are the root causes of this issue? (Multi-Flow Map)
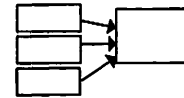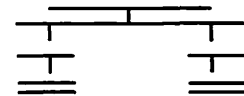
3. Brainstorm and Prioritize Solutions/Options

With root causes identified and the desired state articulated, the group generates solutions and begins to develop consensus around the preferred pathways.

- What are some possible solutions we can brainstorm? (Circle Map, Frame)
- In what priority order might we place these solutions? (Vertical Flow Map)

Thinking Maps, Inc. © 2006 All Rights Reserved

Problem-Solving with Thinking Maps
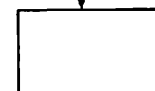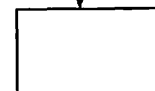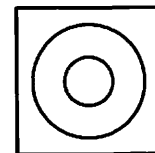
| STAGES IN THE PROCESS | QUESTIONS GUIDING INQUIRY | THINKING MAPS |

4. Analyze Each Option

Anticipating the obvious and unintended effects of each option will help a group determine the best solution and prepare for its successful implementation. Forecasting and predicting impact will enable the group to maximize effort and resources.

- What might be the implications/consequences for each solution? (Multi-Flow Map)
- How might this solution play out over time? (Flow Map)
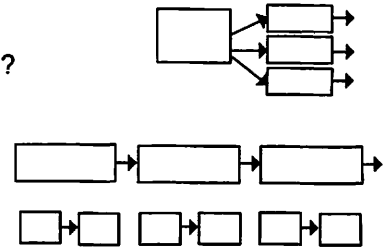
5. Choose A Solution

Having analyzed each option the group is able to develop criteria for comparing and contrasting the possibilities. The previous stages and the Maps associated with them provide the group with a guide for its final decision making.

- What criteria will we use to evaluate each option? (Circle Map, Tree Map)
- How are the different options the Same? Different? (Double Bubble Map)
- How does a review of the previous stages inform our thinking? (All Maps)
- What analogy or metaphor can we use to understand our solution? (Bridge Map)
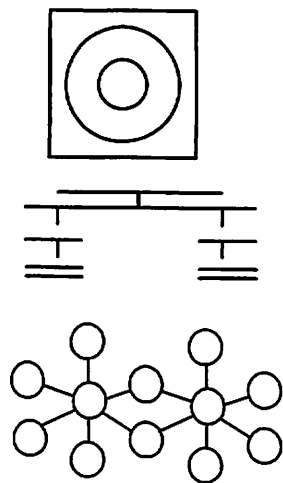
6. Assessing and Sustaining

The ongoing evaluation and refinement of the plan during implementation will be supported by the Thinking Maps documents and the actual outcomes as compared to the desired state.

- How is the current state the same or different from the desired state? (Double Bubble Map)
- What have been the causes and effects of the solution? (Multi-Flow Map)
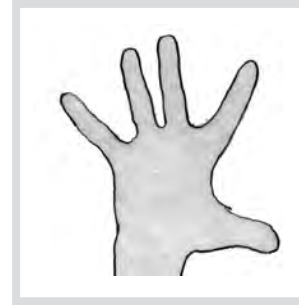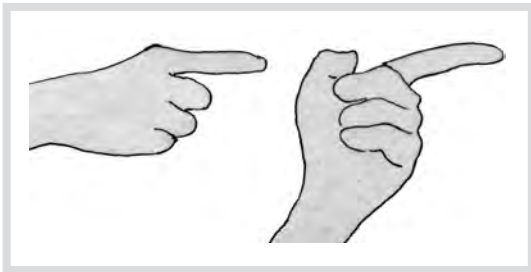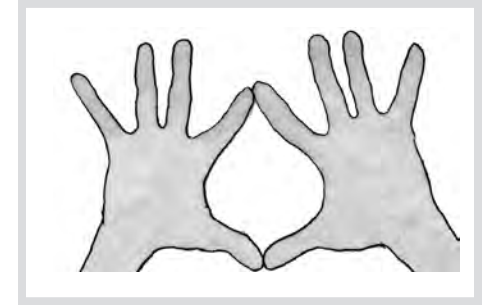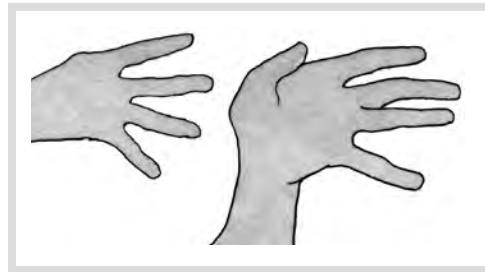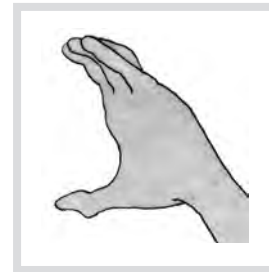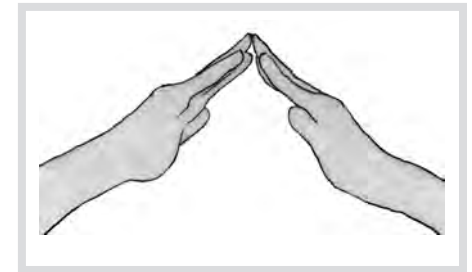- What is this initiative's history? (Flow Map)
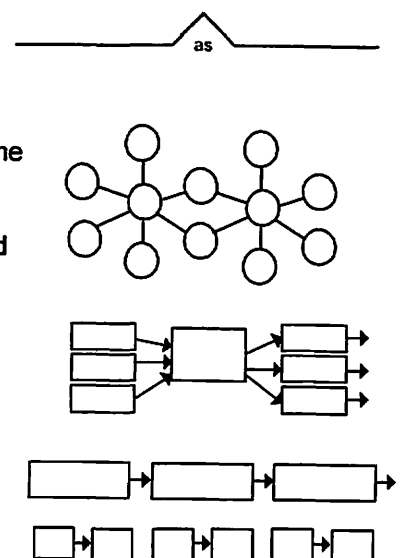
circle map
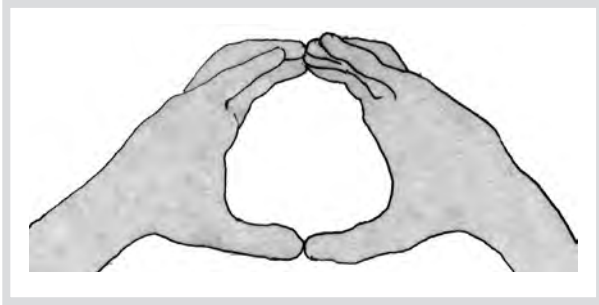
tree map
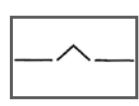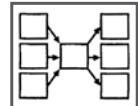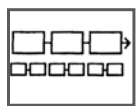
bubble map

double bubble map
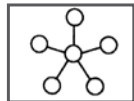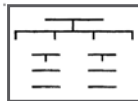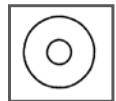
flow map

multi-flow map

brace map

bridge map
relating factor_____

defining in context

classification

attributes

compare & contrast

sequence

cause & effect

whole / part

analogies

frame of reference

Teaching Thinking Maps Using My Story

On the following pages are instructions and Map Masters for introducing each Thinking Map using the My Story activity. Listed below are general instructions for creating final products for each level using all of the completed activities. Make changes as required for your students.

<u>Elementary Suggestions</u>

Grades Pre-K–2: Making Map Murals

- Introduce each of the Maps using the eight activities. Save each page for students (if the activities were done by individuals).

- After all pages are complete, tape each Map on a large poster-board and title the mural: My Story.

- Display these murals around the room. Later, add these pages to the student's folder.

Grades 3–5: Making Oral Presentations

- Introduce each of the Maps using the eight activities. Save each page for students.

- After all of the Maps have been introduced, have the students review their eight Maps. Ask them to decide which of the Maps show(s) the most about who they are.

- Have students create a short oral presentation introducing themselves to the class. Students may use several of the Maps as visual props and/or guides for speaking.

<u>Secondary Suggestions</u>

Grades 6–8: Writing an Autobiography

- Introduce each of the Maps using the eight activities. Students should save all work.

- After each introduction, ask students to write short paragraphs about their Maps. These pages are reviewed and become the ideas for writing a multi-page autobiography.

- Ask students to decide which of the Maps show(s) the most about themselves. This i. one starting point for writing a short autobiography.

Grades 9–12: Reflective Thinking Essay

- Introduce each of the Maps using the eight activities. Students should save all work.

- After each introduction, ask students to write short paragraphs from their Maps. These pages are reviewed and become the ideas for writing an essay about the influences on each of their personal qualities, actions, and futures.

- Ask students to review the eight Maps and develop the short paragraphs they have drafted. Assign an essay prompt similar to this one: Write a 2-3 page essay on the major influences on your character and lif(

TEACHING THE CIRCLE MAP (K–5)

Tell students they will be learning how to visually represent the thought process of
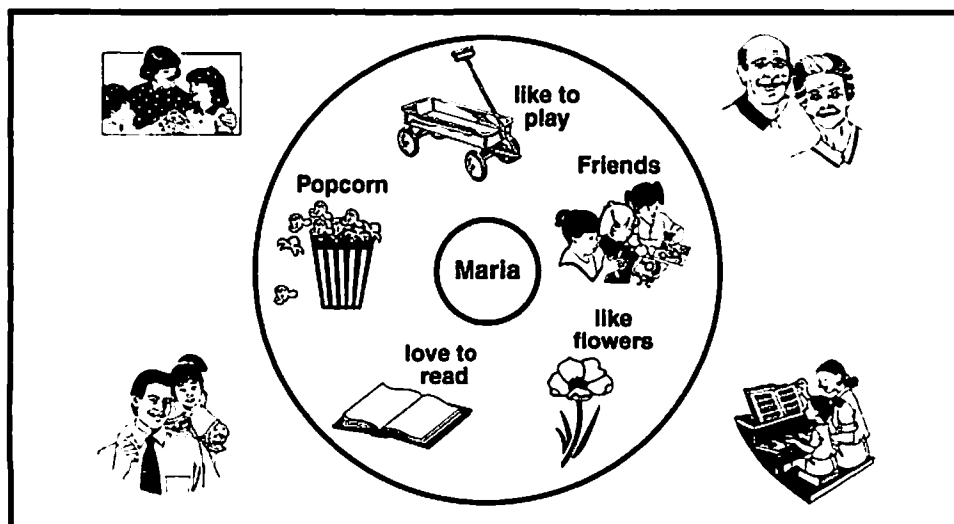
DEFINING IN CONTEXT

Step One: Distribute Circle Maps and have students either draw a picture of themselves or write their name.

Step Two: Within the outside circle, students should draw pictures or write words that show all about who they are: things they like to do, toys they like to play with, food they like to eat . . .

Step Three: Ask students to draw or write inside the Frame around the Circle Map. Tell them to draw pictures of or write the names of people who are important to them.

Step Four: Give students opportunities to share their maps with the whole class or in small groups. These maps should be saved and included in a final product.

TEACHING THE CIRCLE MAP (6–12)

Tell students they will be learning how to visually represent the thought process of
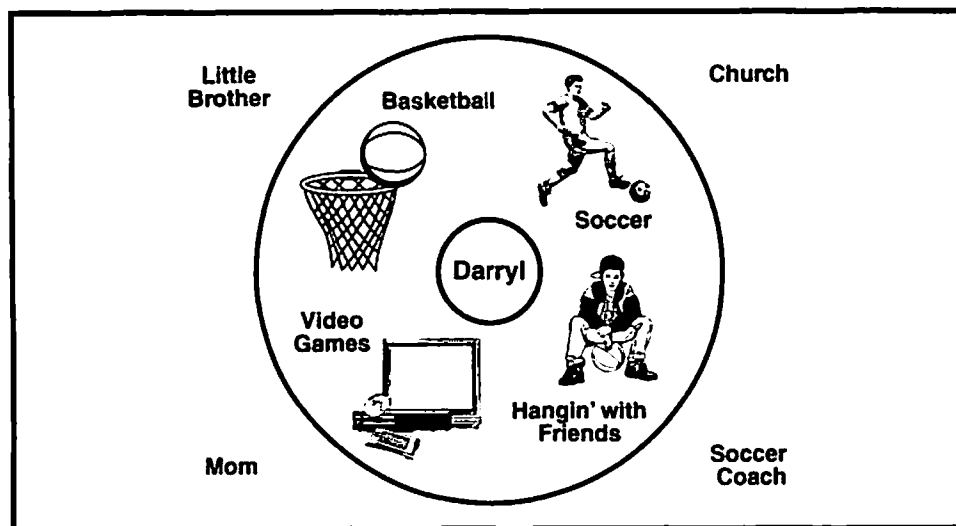
DEFINING IN CONTEXT

Step One: Distribute Circle Maps and have students write their name in the center.

Step Two: Within the outside circle, tell students to brainstorm ideas that show others who they are: things they like to do, hobbies, favorite foods . . .

Step Three: Ask students to write inside the Frame around the Circle Map. Tell them to write the names of people who are important to them or have influenced their lives.

Step Four: Give students opportunities to share their maps orally in small groups or by writing short paragraphs using information in their maps. These maps should be saved and included in a final product.

Little Brother · Basketball · Church · Soccer · Darryl · Video Games · Hangin' with Friends · Mom · Soccer Coach

TEACHING THE BUBBLE MAP (K–5)

Tell students they will be learning how to visually represent the thought process of

DESCRIBING

Step One: Distribute Bubble Maps and have students write their name or draw a picture in the center circle.

Step Two: In the outside bubbles, they should use words or pictures to describe themselves: physical traits (short hair, brown eyes), personality traits (happy, friendly) or feelings or characteristics (intelligent, athletic).

Step Three: Students draw a Frame of Reference around their maps in which they provide evidence to support 1 or 2 of their adjectives.
E.g.: They can draw a smiling face or write "I smile all the time" inside the frame next to that bubble.

Step Four: Provide an opportunity for students to share their maps with the whole class, in small groups, or in pairs. Have them write a sentence using one or two of their descriptors.

pretty   smart

Maria

happy   fun

I smile all the time.

TEACHING THE BUBBLE MAP (6–12)

Tell students they will be learning how to visually represent the thought process of
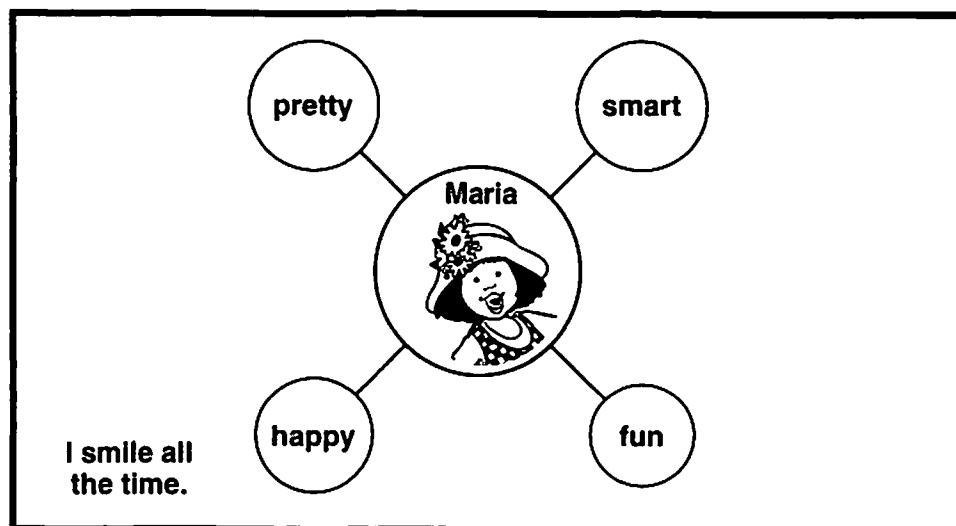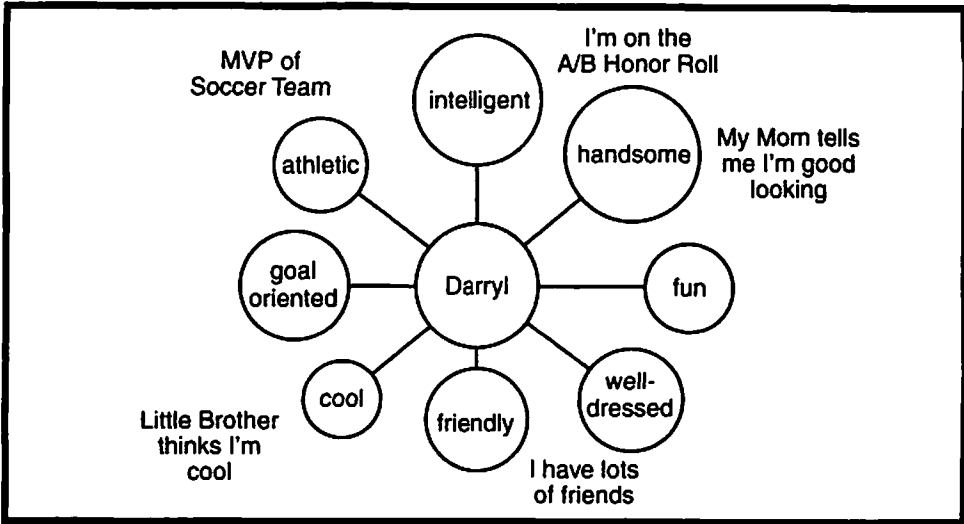
DESCRIBING

Step One: Distribute Bubble Maps and have students write their name or draw a picture in the center circle.

Step Two: In the outside bubbles, they should use words or pictures to describe themselves: physical traits (short hair, brown eyes), personality traits (happy, friendly) or feelings or characteristics (intelligent, athletic).

Step Three: Students draw a Frame of Reference around their maps in which they provide evidence to support 1 or 2 of their adjectives.
E.g.: They can draw a smiling face or write "I smile all the time" inside the frame next to that bubble.

Step Four: Provide an opportunity for students to share their maps with the whole class, in small groups, or in pairs. Have them write a sentence using one or two of their descriptors.

MVP of
Soccer Team

I'm on the
A/B Honor Roll

intelligent

handsome

My Mom tells
me I'm good
looking

athletic

goal
oriented

Darryl

fun

cool

friendly

well-
dressed

Little Brother
thinks I'm
cool

I have lots
of friends

TEACHING THE DOUBLE BUBBLE MAP (K–5)

Tell students they will be learning how to visually
represent the thought process of

COMPARING AND CONTRASTING

Step One: Pair students and distribute Double Bubble Maps. (Optional: You may have students share Circle Maps as a way to get to know each other.) Have students write their name and their partner's name in the two larger circles. (Primary students can draw pictures.)

Step Two: In the middle bubbles, students should tell how they are like their partner, identifying what they have in common.

Step Three: In the two sets of outside bubbles, they should identify how they differ from one another. (If they have shared their Circle Maps, remind them that they may include information not found in their Circle Maps.)

Step Four: Ask students to draw a Frame of Reference around their map. Inside the frame they should tell how they learned these things about each other. E.g., "We shared our Circle Maps", or "We've known each other for 2 years."

Step Five: Go around the class and ask each pair to share one important thing they learned about each other while making their map.

We looked at our Circle Maps

brown hair
both girls
blond hair
a baby sister
Maria
have a brother
Jenny
an older sister
like math
reads all the time
like pizza
spends time drawing

We interviewed each other

TEACHING THE DOUBLE BUBBLE MAP (6–12)

Tell students they will be learning how to visually represent the thought process of

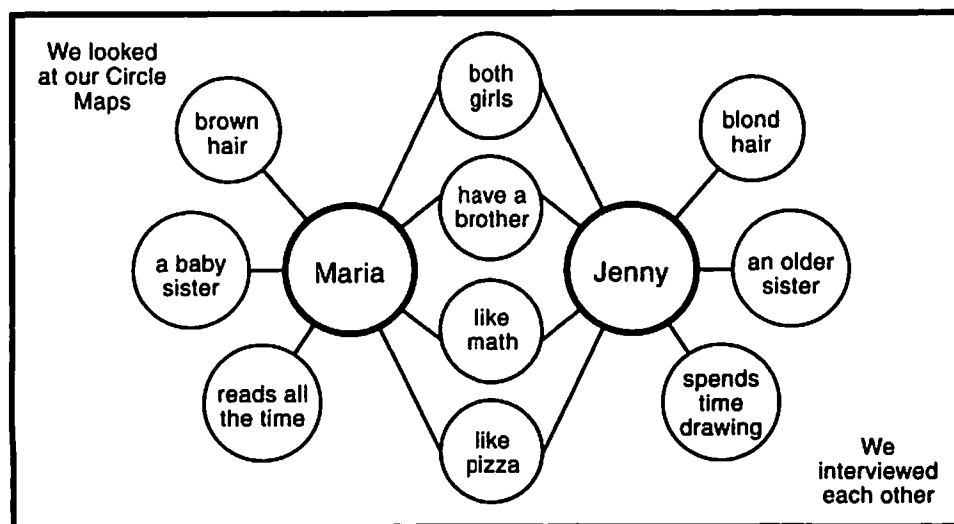# COMPARING AND CONTRASTING

Step One: Pair students and distribute Double Bubble Maps. (Optional: You may have students share Circle Maps as a way to get to know each other.) Have students write their name and their partner's name in the two larger circles.

Step Two: In the middle bubbles, students should tell how they are like their partner, identifying what they have in common.

Step Three: In the two sets of outside bubbles, they should identify how they differ from one another. (If they have shared their Circle Maps, remind them that they may include information not found in their Circle Maps.)

Step Four: Ask students to draw a Frame of Reference around their map. Inside the frame they should tell how they learned these things about each other. E.g., "We shared our Circle Maps", or "We interviewed each other."

Step Five: Go around the class and ask each pair to share one important thing they learned about each other while making their map. Students can work together to write about one of their similarities or differences.
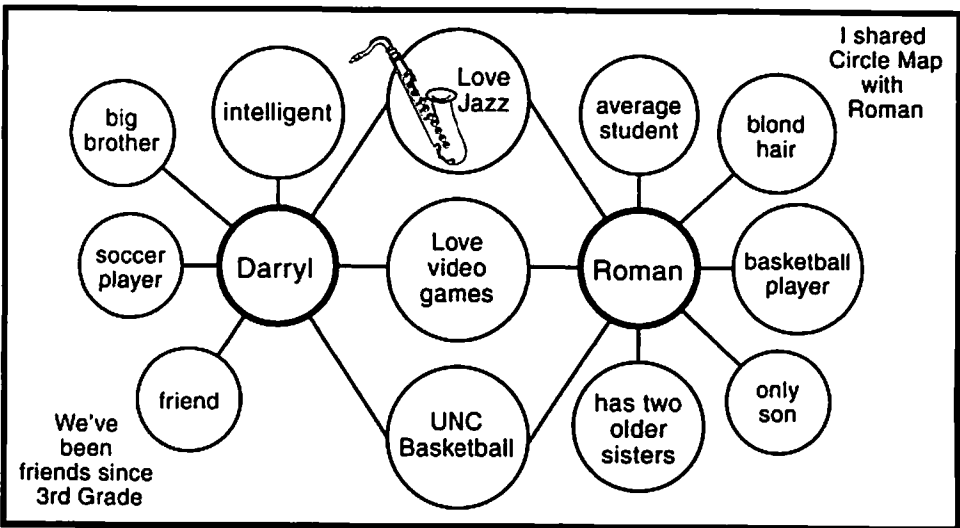
TEACHING THE TREE MAP (K–5)

Tell students they will be learning how to visually represent the thought process of
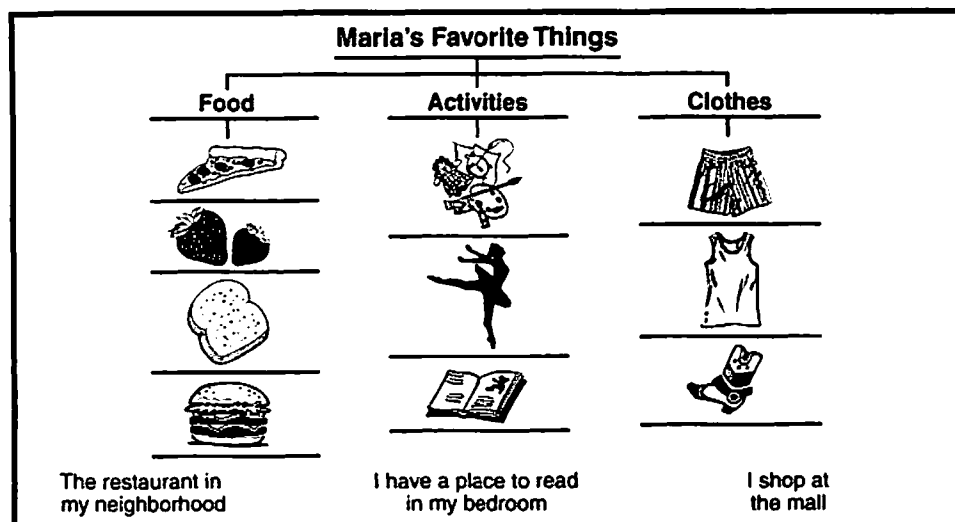
CLASSIFYING

Step One: Before distributing the maps, ask students: "What are your favorite things?" Allow time for discussion. Distribute the Tree Maps and ask the class to write "My Favorite Things" on the top line.

Step Two: Ask students to think of 2, 3 or 4 categories to classify their favorite things (food, toys, games, clothes . . .). Have them write the name of these categories on the next lines.

Step Three: Under each category, have them list examples of each favorite thing within that group.

Step Four: Have students draw a Frame of Reference around their Tree Map. Inside the frame they should include the names of specific places where they can find these things.

Step Five: Allow time for students to share their maps with each other.

Marla's Favorite Things

Food	Activities	Clothes
The restaurant in my neighborhood	I have a place to read in my bedroom	I shop at the mall

TEACHING THE TREE MAP (6–12)

Tell students they will be learning how to visually represent the thought process of
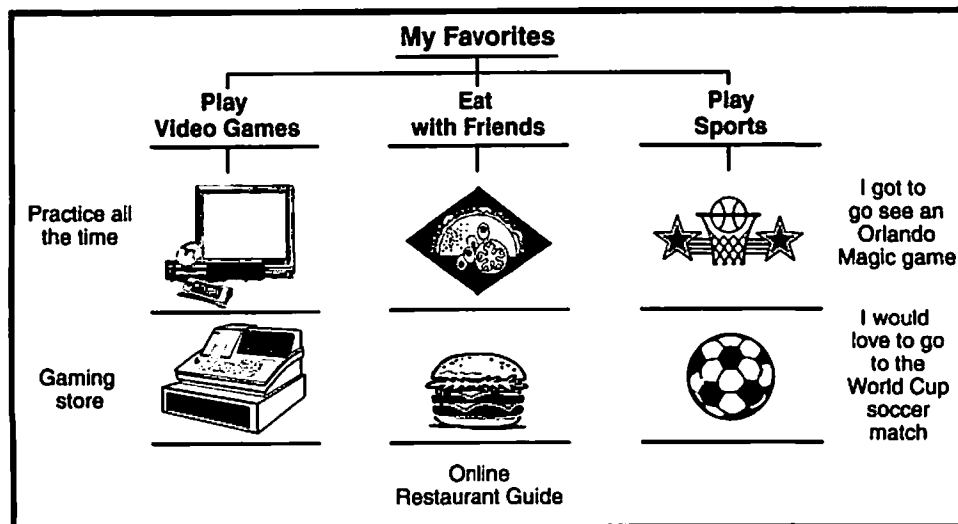
CLASSIFYING

Step One: Before distributing the maps, ask students: "Who and what are your favorite people, places and things?" Allow time for discussion. Distribute the Tree Maps and ask the class to write "My Favorites" on the top line.

Step Two: Ask students to classify their favorites into 3 or 4 categories. Have them write the name of these categories on the next lines.

Step Three: Under each category, have them list examples of each favorite thing within that group.

Step Four: Have students add a Frame of Reference to their Tree Map. Inside the frame, they should write the name of sources they could reference to find out more information about their favorites.

Step Five: Allow time for students to share their maps with each other.

My Favorites

Play Video Games	Eat with Friends	Play Sports
Practice all the time		I got to go see an Orlando Magic game
Gaming store	Online Restaurant Guide	I would love to go to the World Cup soccer match

TEACHING THE BRACE MAP (K-5)

Tell students they will be learning how to visually
represent the thought process of

WHOLE TO PART RELATIONSHIPS

Step One: Before distributing the map, ask students: "If you were to put on your favorite outfit, what would be all of the parts and pieces of that outfit?"

Step Two: Distribute the Brace Map and have students draw pictures of three major parts.

Step Three: For each major part, ask students to write down and draw pictures of the minor parts.

Step Four: Have students add a Frame of Reference to answer the question, "What is influencing my choice of this as my favorite outfit?"

Step Five: Allow time for students to share their maps with each other.

My Favorite Outfit
- Shirt
  - Buttons
  - Ribbons
- Pants
  - Belt
  - Pockets
- Shoes
  - Laces
  - Flowers
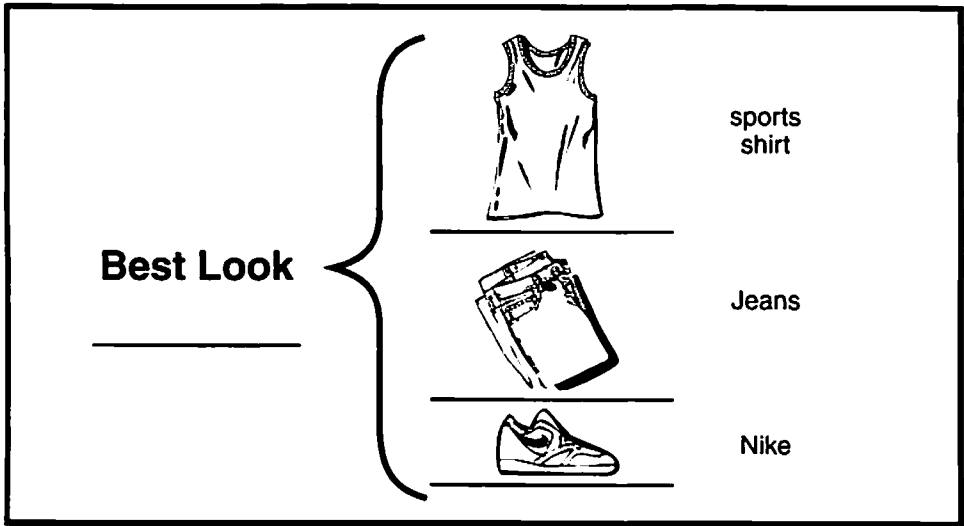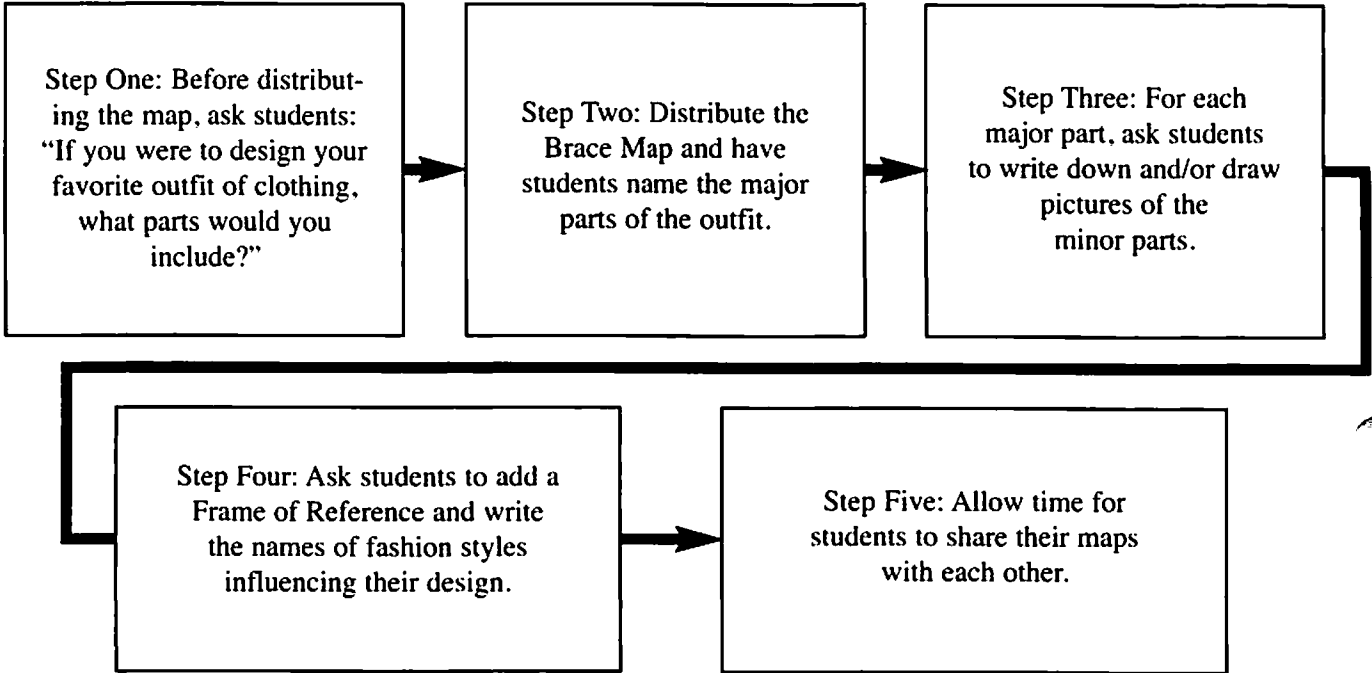
I like to play outside

TEACHING THE BRACE MAP (6–12)

Tell students they will be learning how to visually
represent the thought process of

WHOLE TO PART RELATIONSHIPS

Step One: Before distribut-
ing the map, ask students:
"If you were to design your
favorite outfit of clothing,
what parts would you
include?"

Step Two: Distribute the
Brace Map and have
students name the major
parts of the outfit.

Step Three: For each
major part, ask students
to write down and/or draw
pictures of the
minor parts.

Step Four: Ask students to add a
Frame of Reference and write
the names of fashion styles
influencing their design.

Step Five: Allow time for
students to share their maps
with each other.

Best Look

sports
shirt

Jeans

Nike

TEACHING THE FLOW MAP (K–5)

Tell students they will be learning how to visually represent the thought process of
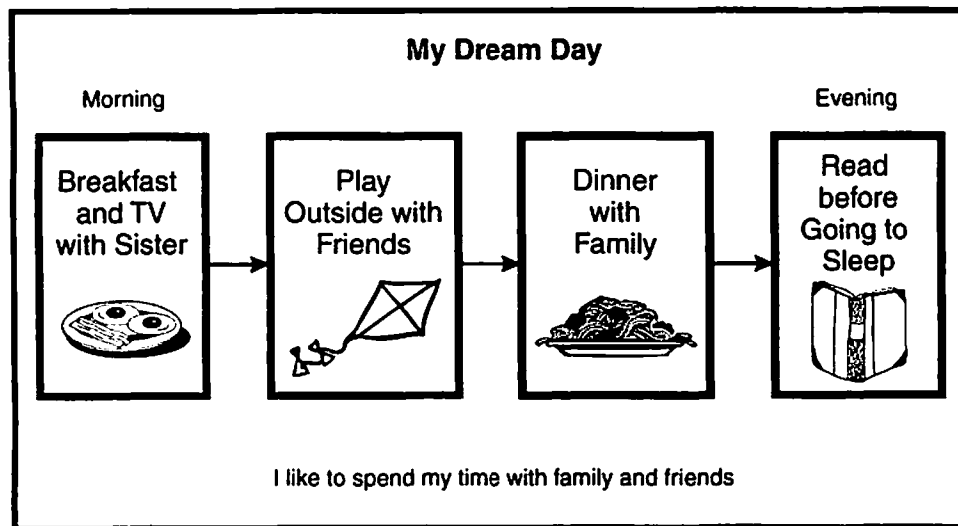
SEQUENCING

Step One: Distributing the Flow Map and ask students: "What is your favorite activity in the morning? In the afternoon? In the evening?"

Step Two: Ask students to write or draw pictures of each activity in the Flow Map for a "Dream Day."

Step Three: Have students add a Frame of Reference around their Flow Map. Ask them to complete the following sentence: "I like to spend my time . . ."
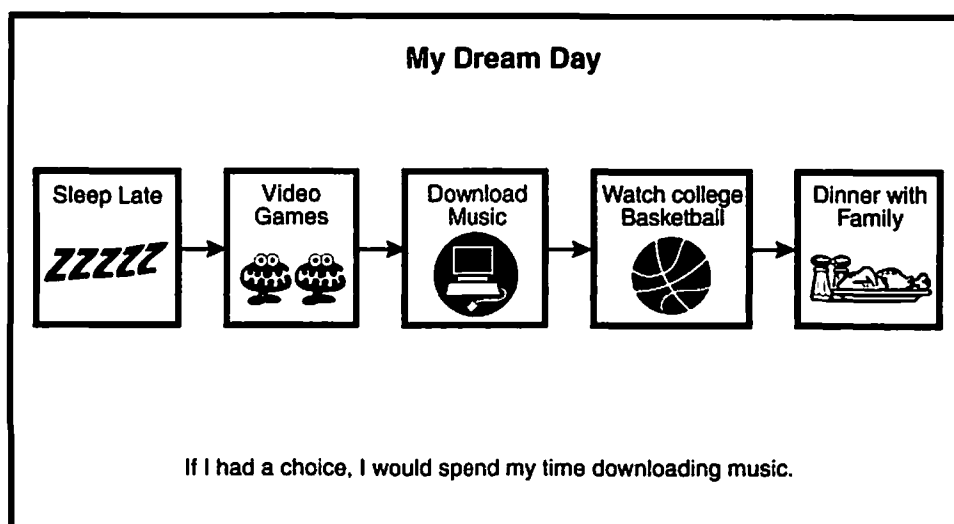
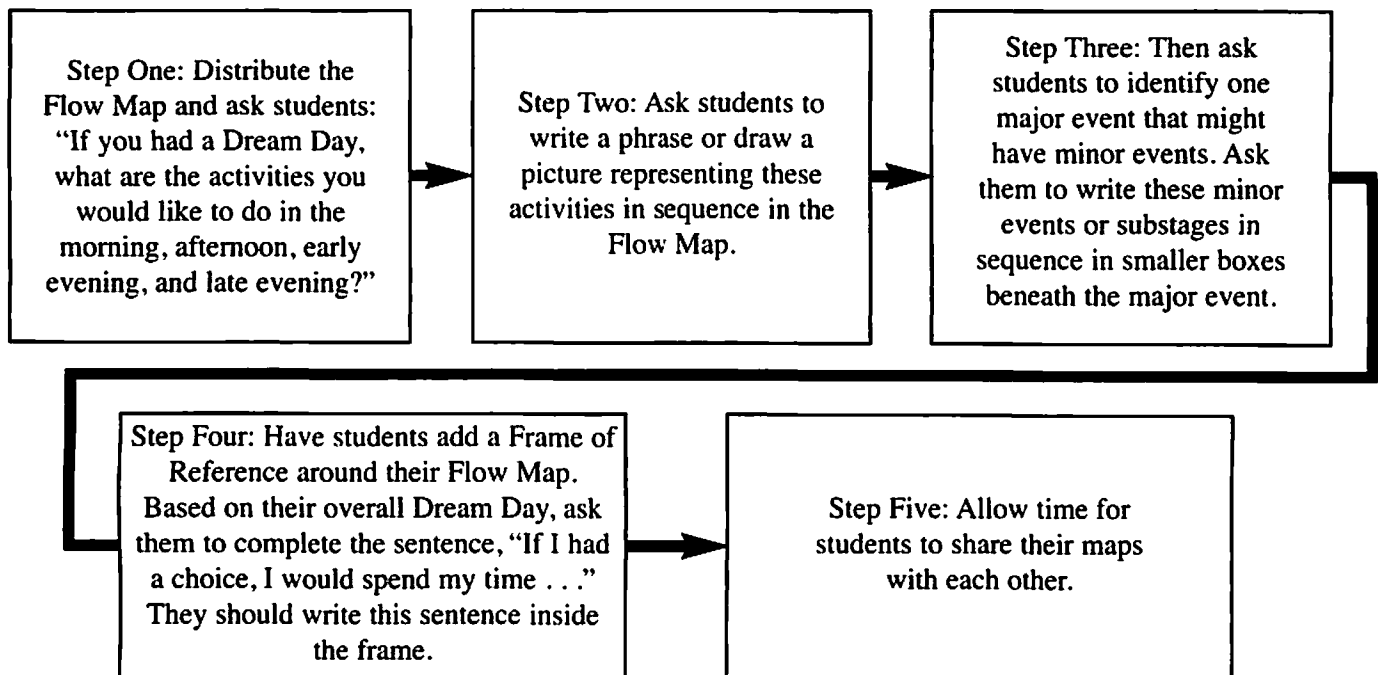Step Four: Allow time for students to share their maps with each other.

My Dream Day

Morning

Evening

| Breakfast and TV with Sister | Play Outside with Friends | Dinner with Family | Read before Going to Sleep |

I like to spend my time with family and friends

TEACHING THE FLOW MAP (6–12)

Tell students they will be learning how to visually represent the thought process of

SEQUENCING

Step One: Distribute the Flow Map and ask students: "If you had a Dream Day, what are the activities you would like to do in the morning, afternoon, early evening, and late evening?"

Step Two: Ask students to write a phrase or draw a picture representing these activities in sequence in the Flow Map.

Step Three: Then ask students to identify one major event that might have minor events. Ask them to write these minor events or substages in sequence in smaller boxes beneath the major event.

Step Four: Have students add a Frame of Reference around their Flow Map. Based on their overall Dream Day, ask them to complete the sentence, "If I had a choice, I would spend my time . . ." They should write this sentence inside the frame.

Step Five: Allow time for students to share their maps with each other.

My Dream Day

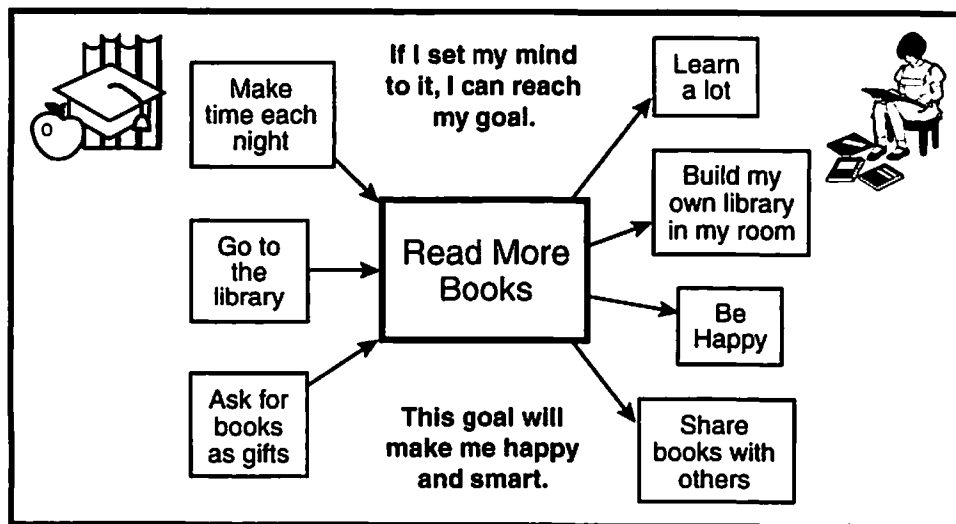| Sleep Late | Video Games | Download Music | Watch college Basketball | Dinner with Family |

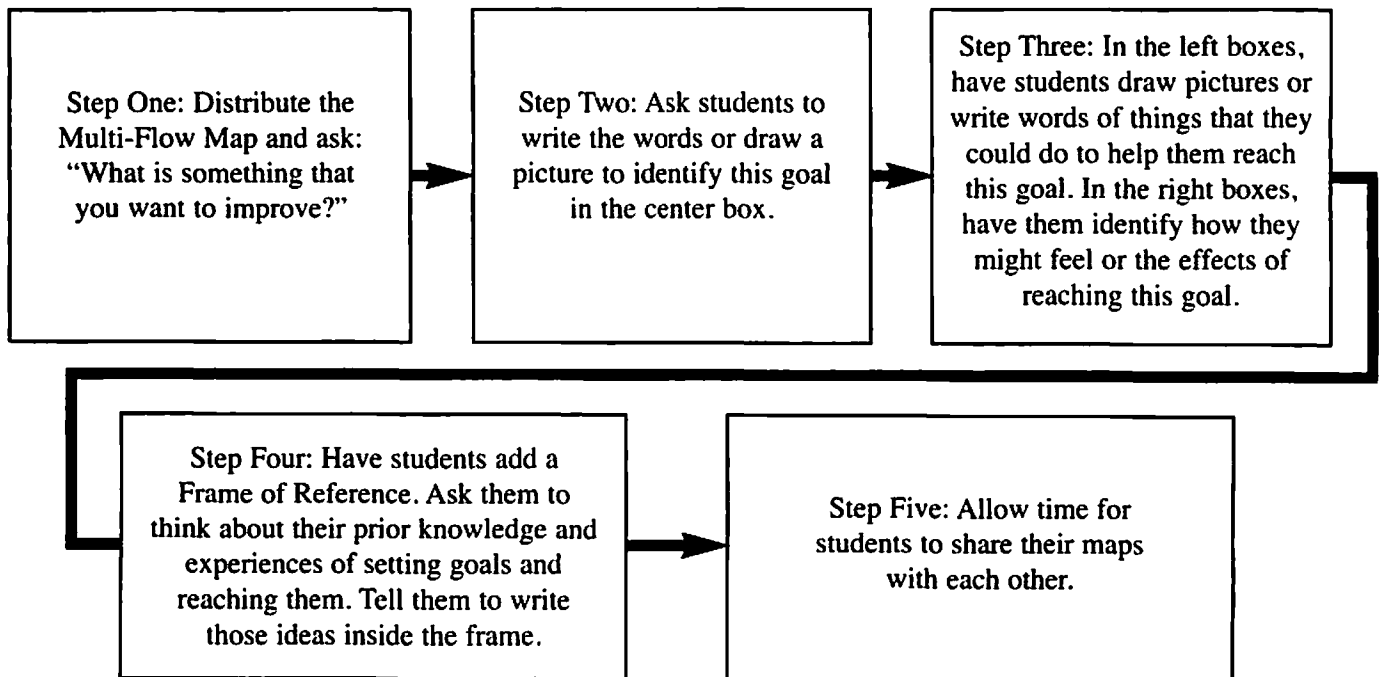If I had a choice, I would spend my time downloading music.
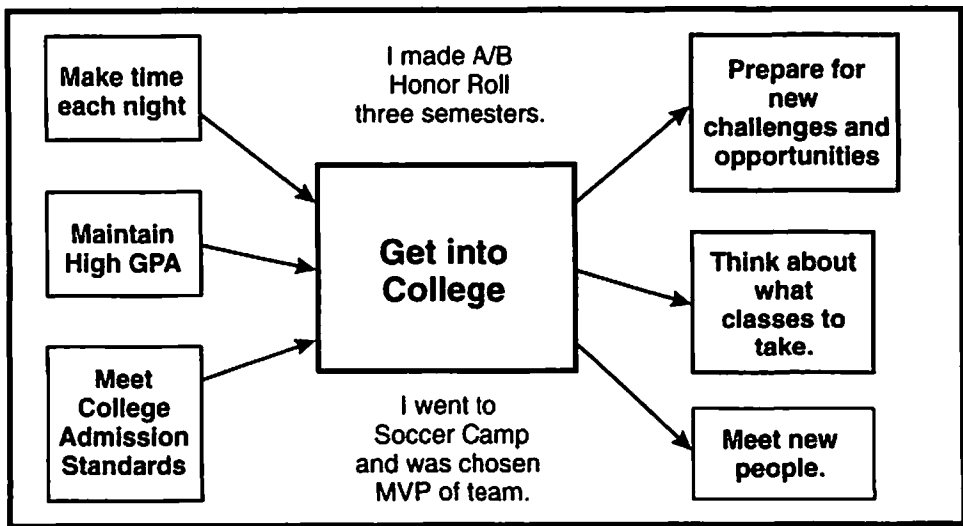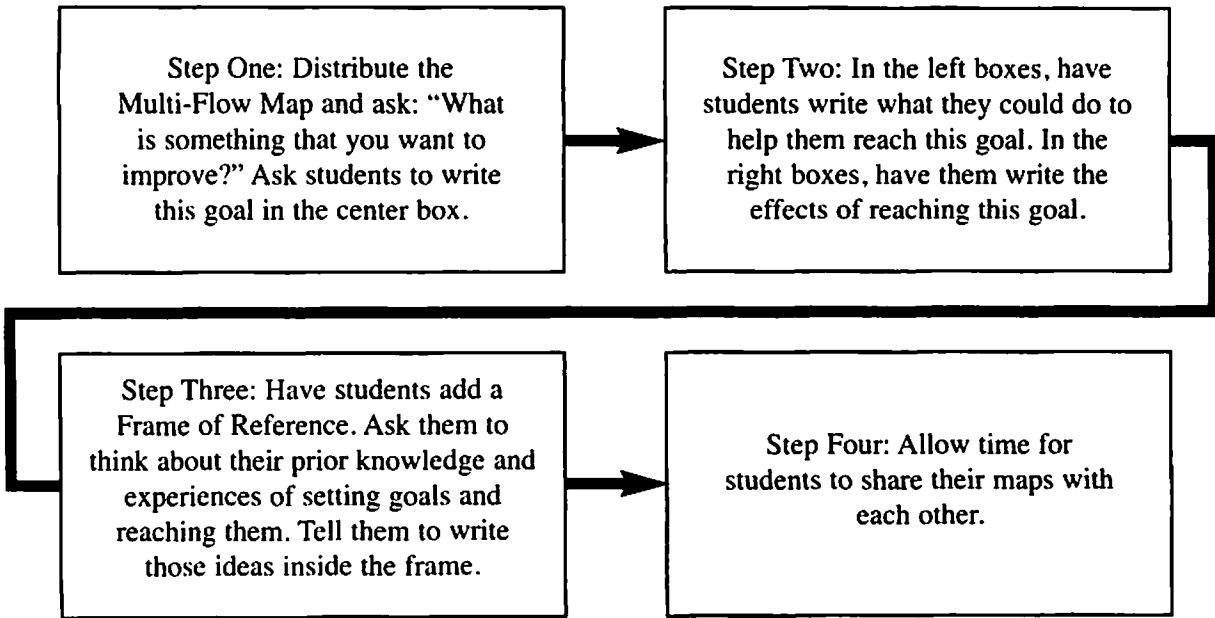
TEACHING THE MULTI-FLOW MAP (K–5)

Tell students they will be learning how to visually
represent the thought process of

CAUSE AND EFFECT

Step One: Distribute the Multi-Flow Map and ask: "What is something that you want to improve?"

Step Two: Ask students to write the words or draw a picture to identify this goal in the center box.

Step Three: In the left boxes, have students draw pictures or write words of things that they could do to help them reach this goal. In the right boxes, have them identify how they might feel or the effects of reaching this goal.

Step Four: Have students add a Frame of Reference. Ask them to think about their prior knowledge and experiences of setting goals and reaching them. Tell them to write those ideas inside the frame.

Step Five: Allow time for students to share their maps with each other.

If I set my mind to it, I can reach my goal.

Make time each night

Go to the library

Ask for books as gifts

Read More Books

This goal will make me happy and smart.

Learn a lot

Build my own library in my room

Be Happy

Share books with others

TEACHING THE MULTI-FLOW MAP (6–12)

Tell students they will be learning how to visually
represent the thought process of

CAUSE AND EFFECT

Step One: Distribute the Multi-Flow Map and ask: "What is something that you want to improve?" Ask students to write this goal in the center box.

Step Two: In the left boxes, have students write what they could do to help them reach this goal. In the right boxes, have them write the effects of reaching this goal.

Step Three: Have students add a Frame of Reference. Ask them to think about their prior knowledge and experiences of setting goals and reaching them. Tell them to write those ideas inside the frame.

Step Four: Allow time for students to share their maps with each other.

I made A/B
Honor Roll
three semesters.

Make time each night

Maintain High GPA

Meet College Admission Standards

Get into College

I went to
Soccer Camp
and was chosen
MVP of team.

Prepare for new challenges and opportunities

Think about what classes to take.

Meet new people.

TEACHING THE BRIDGE MAP (K–5)

Tell students they will be learning how to visually represent the thought process of

SEEING ANALOGIES

Step One: Distribute the Bridge Map and ask: "Who is a person who takes care of you?"

Step Two: Ask students to draw a picture or write the name of that person in the top-left area of the map, and their own name or picture in the bottom-left area.

Step Three: Then ask, "Whom, or what, do you take care of?" Ask students to draw a picture of themselves or write their name in the top-right area of the map, and the person or thing that they take care of in the bottom-right area.

Step Four: Allow time for students to share their maps with each other.

take(s) care of

Relating Factor

ME

I

as   as

It is important to take care of each other.

TEACHING THE BRIDGE MAP (6–12)

Tell students they will be learning how to visually represent the thought process of

SEEING ANALOGIES

Step One: Distribute the Bridge Map and ask students: "What are you responsible for at home or at school?"

Step Two: Ask students to write their name in the top-left area of the map and what they are responsible for in the bottom-left area.

Step Three: Then ask them to identify someone else in their family or a friend at school who also has responsibilities. They should write that person's name in the top-right area and what they are responsible for.

Step Four: Ask students to add a Frame of Reference and write within that frame their prior experiences with responsibility.

Step Five: Allow time for students to share their maps with each other.

I watch my little brother at night while Mom works.

Am (Is) Responsible For...
Relating Factor

I — as — My Little Brother

Making Good Grades — Keeping His Room Clean

I take the garbage and recycling out every Thursday.

Thinking Maps Summary Page

Distributing the Summary Page
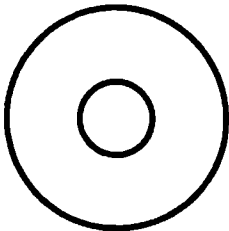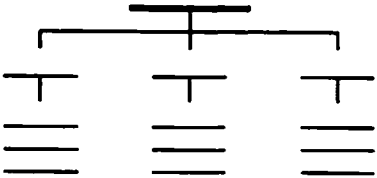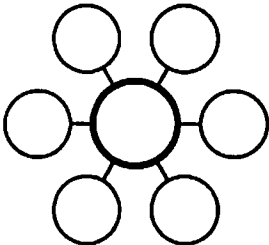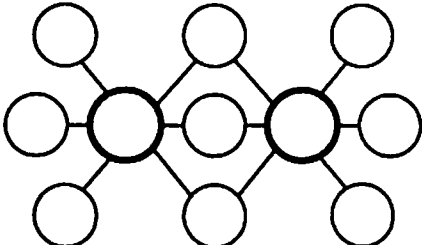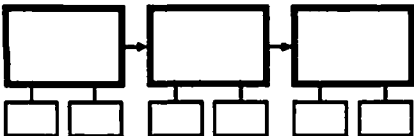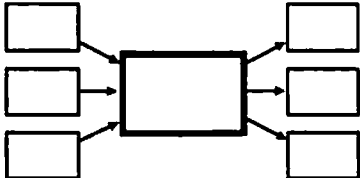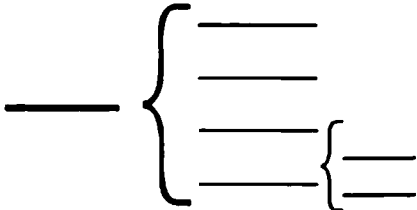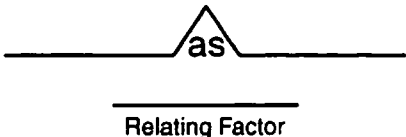
After the My Story activities have been completed, the Thinking Maps Summary Page may be duplicated and distributed to the students in grades 2 and above.

This page summarizes each of the Maps and provides the key thinking process vocabulary that should be reinforced when using each Map. This summary, along with the classroom poster set, further supports students as they gain ownership of these learning tools.

Uses of the Summary Page

Here are some basic uses of the Thinking Maps Summary Page:

- Ask students to insert this page in the front of their folders or notebooks which they keep at their desks for each reference.

- Make copies of this page and place them in your lesson plan book, on your desk or work table, and tape a copy in the corner of your chalkboard as a reminder to consistently integrate Thinking Maps into appropriate lessons and classroom discussions.

- If you don't have the Cooperative Thinking Maps Desk Maps: When students are working in groups make sure every member has a copy of this page for reinforcing their use of the Maps during cooperative learning sessions.

- Reduce the size of this page and make enough copies for every desk. Tape the reduced size Summary Page to each student desk for easy reference. Enlarge this page to poster size and display it in the classroom for easy references for you and your students.

FOR DEFINING IN CONTEXT	FOR CLASSIFYING AND GROUPING
Circle Map	Tree Map
FOR DESCRIBING USING ADJECTIVES	FOR COMPARING AND CONTRASTING
Bubble Map	Double Bubble Map
FOR SEQUENCING AND ORDERING	FOR CAUSES AND EFFECTS
Flow Map	Multi-Flow Map
FOR ANALYZING WHOLE OBJECTS AND PARTS	FOR SEEING ANALOGIES
Brace Map	Relating Factor Bridge Map

STRATEGIES FOR SUCCESSFUL CLASSROOM INTRODUCTION

1. Essential First Step: Introduce the Thinking Maps to your students over a period of 8 – 10 weeks.

2. Display the posters in the front of your room, either one at a time or all at once depending upon your students.

3. Emphasize the thought process of each Thinking Map in your guiding questions and activities.

4. Provide a variety of ways for students to share their maps in order to "take the information off the map."

5. Encourage students to go beyond the basic format of each map as they construct their thinking in a variety of content areas.

STRATEGIES FOR SUCCESSFUL CLASSROOM IMPLEMENTATION THROUGHOUT THE YEAR

1. Use all eight maps in all content areas

2. Ask students to use multiple maps to show their thinking about a topic or subject.

3. Provide a variety of opportunities for students to construct their Thinking Maps individually, in pairs, small groups and with the whole class.

4. Use Thinking Maps at different stages within your lesson: for a hook, to diagnose prior knowledge, for direct instruction, student processing, homework, assessment.

5. Allow students to select the map of their choice to show their understanding or thinking about a topic or subject.

6. Encourage students to add a Frame of Reference to facilitate more reflective thinking.

STRATEGIES FOR SUCCESSFUL SCHOOL-WIDE IMPLEMENTATION THROUGHOUT THE YEAR

1. Share your map success and questions with colleagues during grade level, departmental, and whole school meetings.
2. Conduct an informational class for parents and interested adults.
3. Collect examples of model maps from all grade levels and content areas.
4. Built a collection of student and teacher work using the maps to teach state goals and standards.
5. Assess the use of Thinking Maps by your students, yourself, the whole school at least twice a year. Use the data collected to set new goals and expectations.

IMPLEMENTATION PLANS

The effects of implementing a teaching plan are:

OUTCOMES

EVENT

YOUR STUDENTS UNDERSTAND THE FUNDAMENTAL REASONS FOR USING THINKING MAPS.

YOU HAVE IMPLEMENTED A PLAN FOR TEACHING THINKING MAPS TO YOUR STUDENTS.

YOUR STUDENTS CAN DRAW EACH OF THE THINKING MAPS.

YOUR STUDENTS HAVE BEGUN TO UNDERSTAND THE PURPOSE FOR EACH THINKING MAP AND CAN RECOGNIZE THEM WHEN APPLIED IN CONTENT AREAS.

YOU CAN MATCH THE COGNITIVE VOCABULARY THAT CORRESPONDS TO EACH THINKING MAP.

YOU HAVE MODELED THE USE OF THINKING MAPS IN A VARIETY OF CURRICULUM AREAS.

Once you have completed the teaching plan, refer to the self-assessments found in **Chapter 6.** These Assessments can be found on pages 296 to 300.

"Taking It Off the Map"

Writing Suggestions

Because the maps ask students to use individual words and phrases, giving them an opportunity to write complete sentences from their maps improves their ability to communicate in writing. (Hint: Asking students to highlight the information in the map that they used in their writing helps them visualize the connection of thinking and planning to writing.)

1. Students can write a sentence or two using the information in the map they have created.

2. Students can be asked to explain the information in their maps by writing several sentences summarizing the map's main idea.

3. Students can write a paragraph on the topic covered in the map.
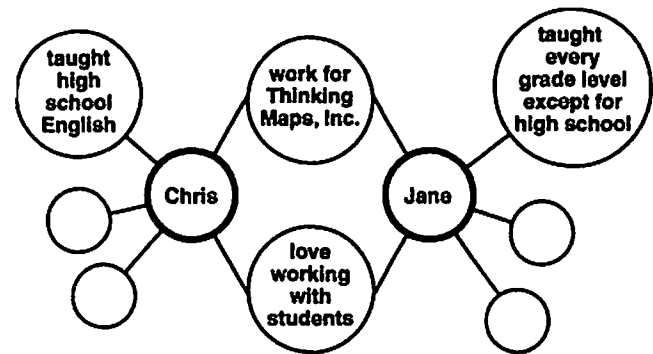
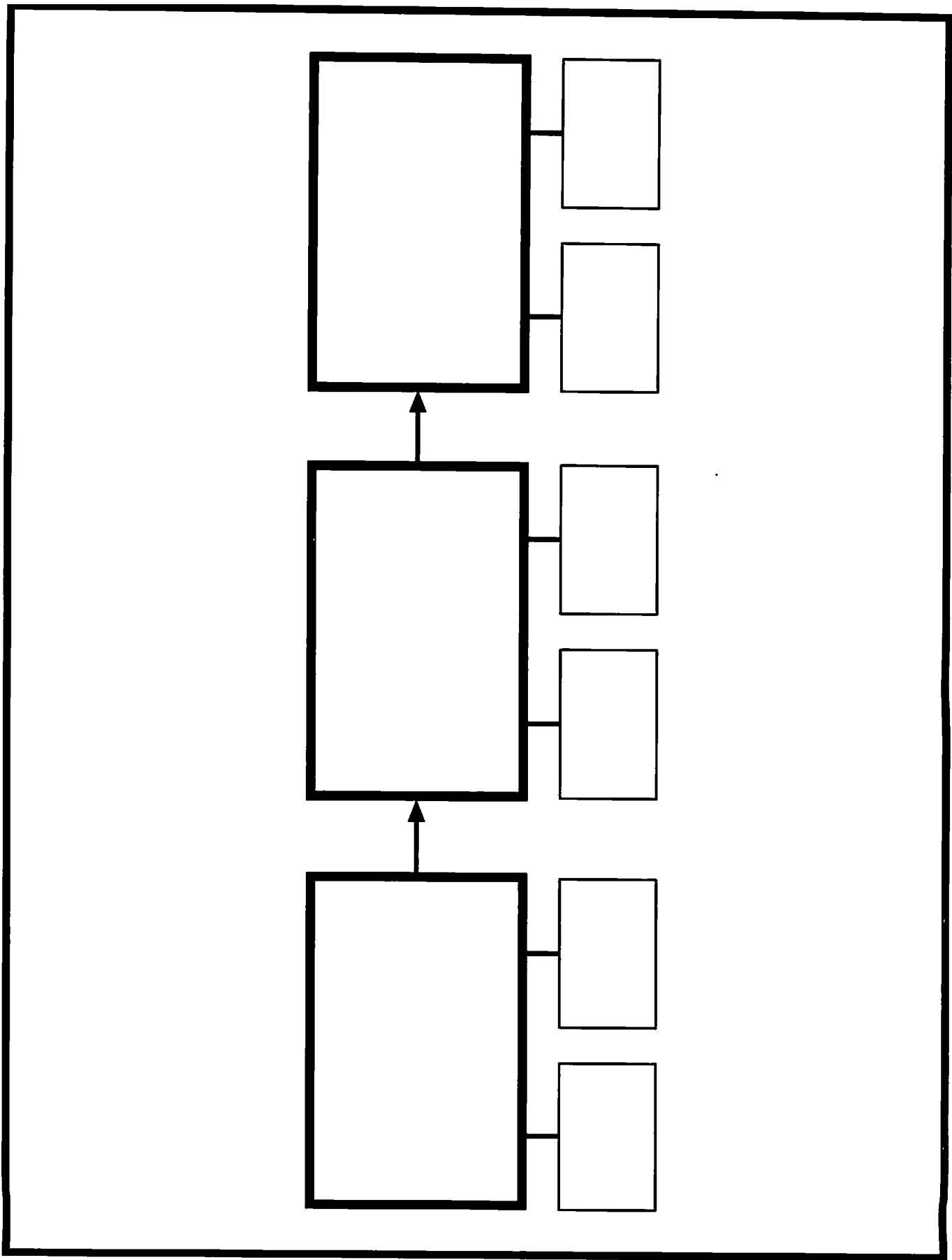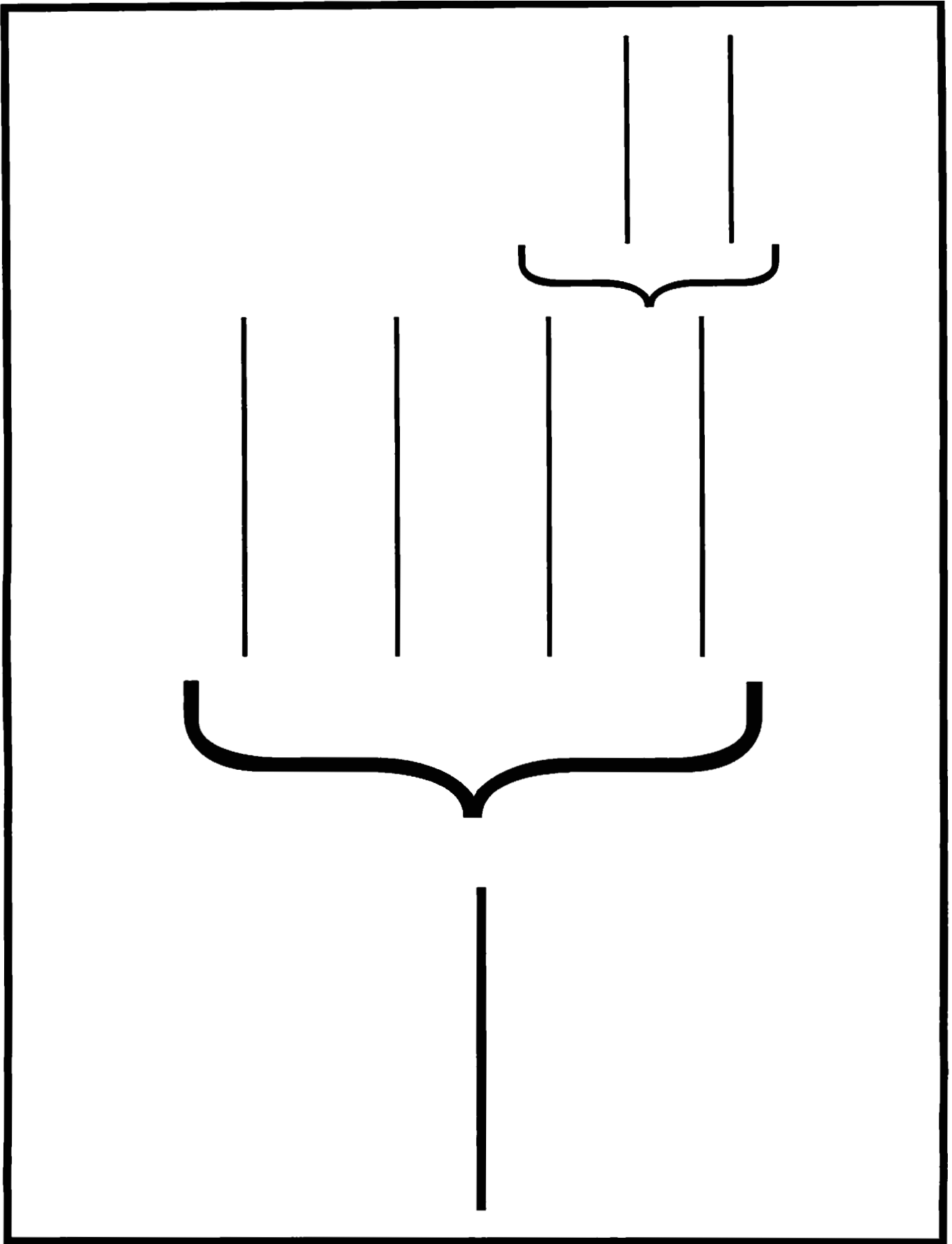Both Chris and Jane love to work
with students.
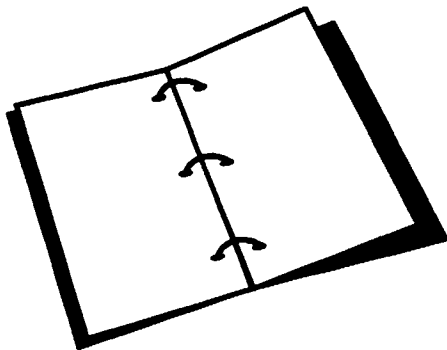
Publishing Their Ideas

1. Bulletin boards
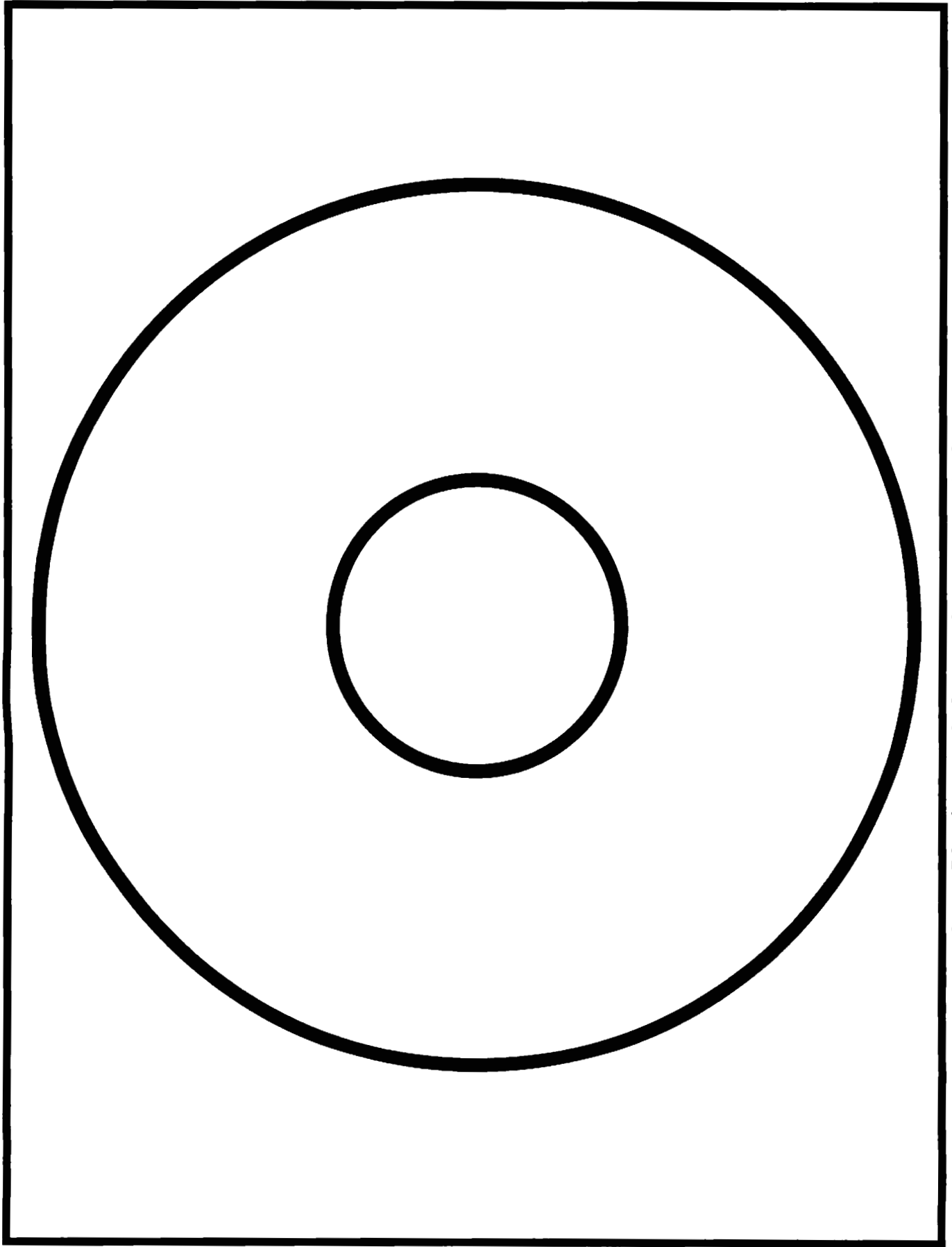2. Student folders and booklets
3. Group or Team posters
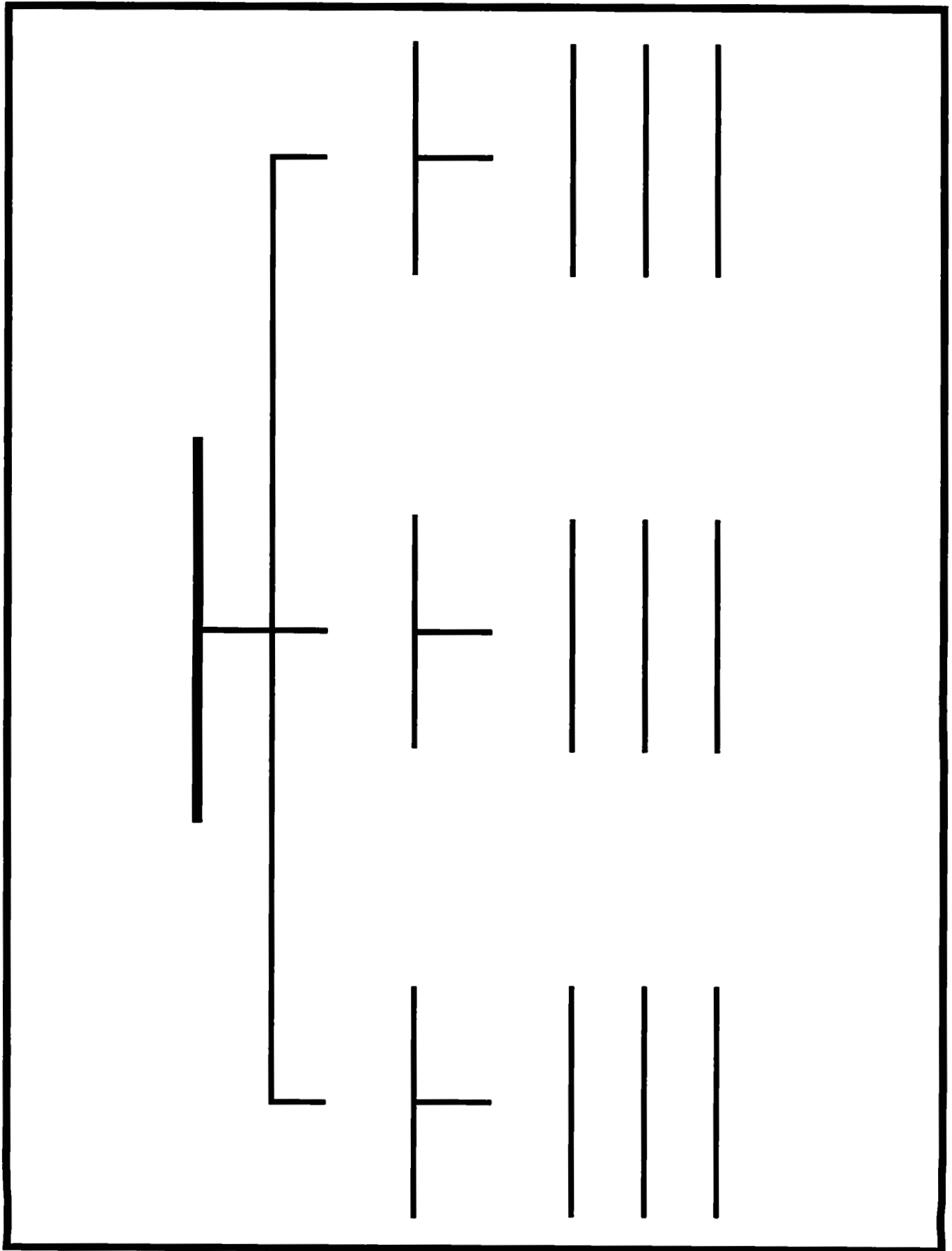
Tree Map for Classifying
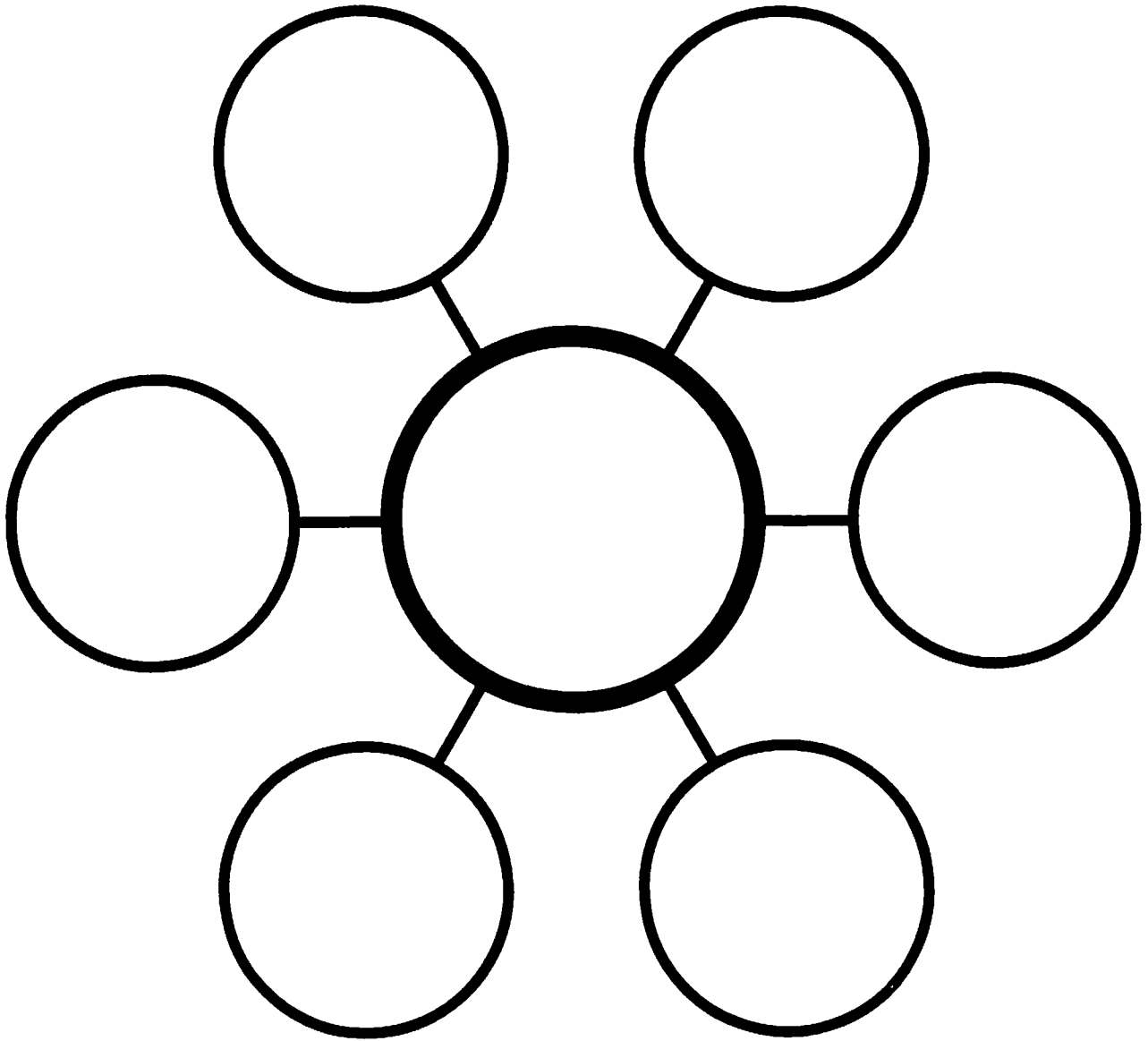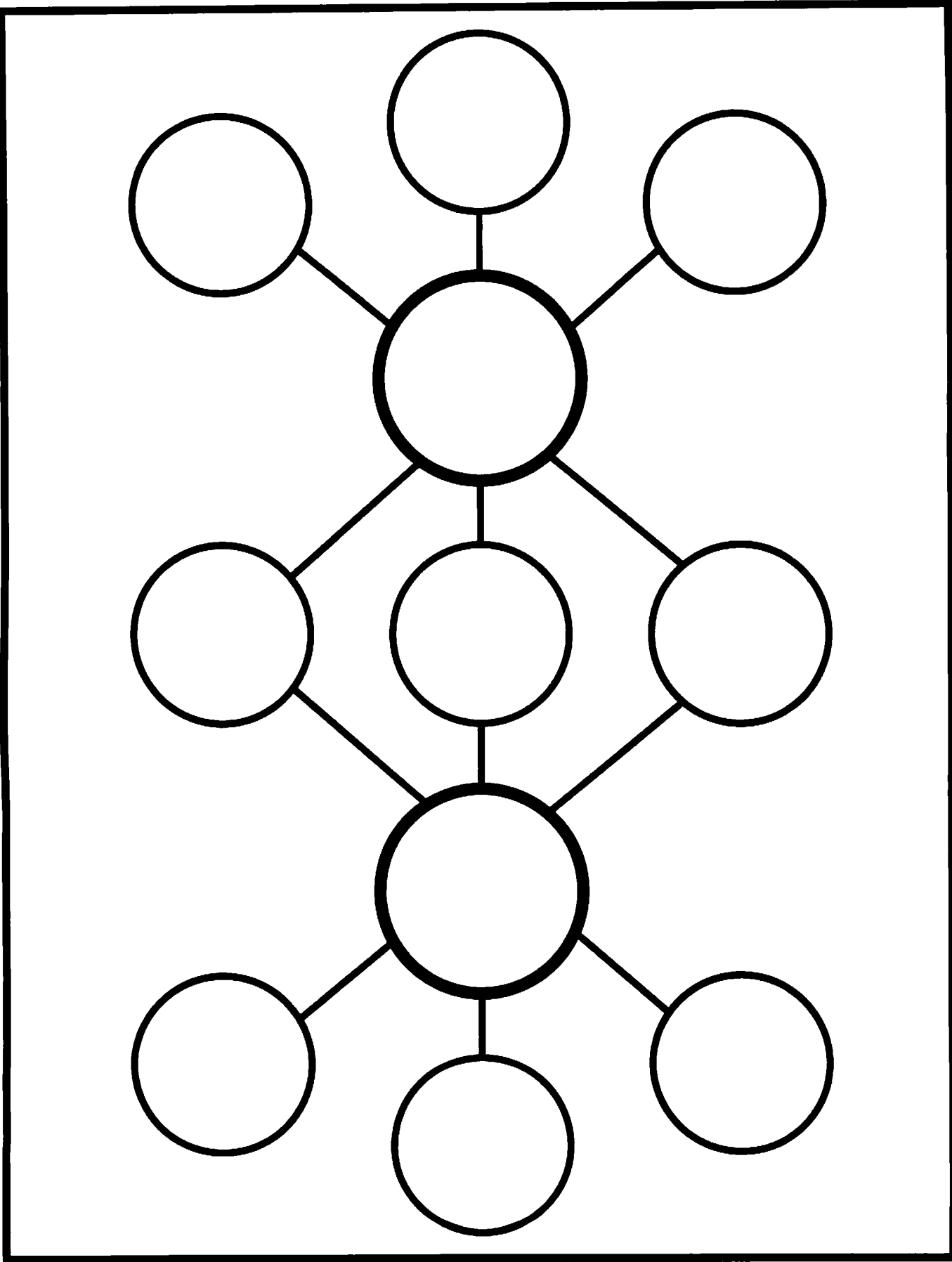
Flow Map for Sequencing

Circle Map for Defining in Context

as

Relating Factor

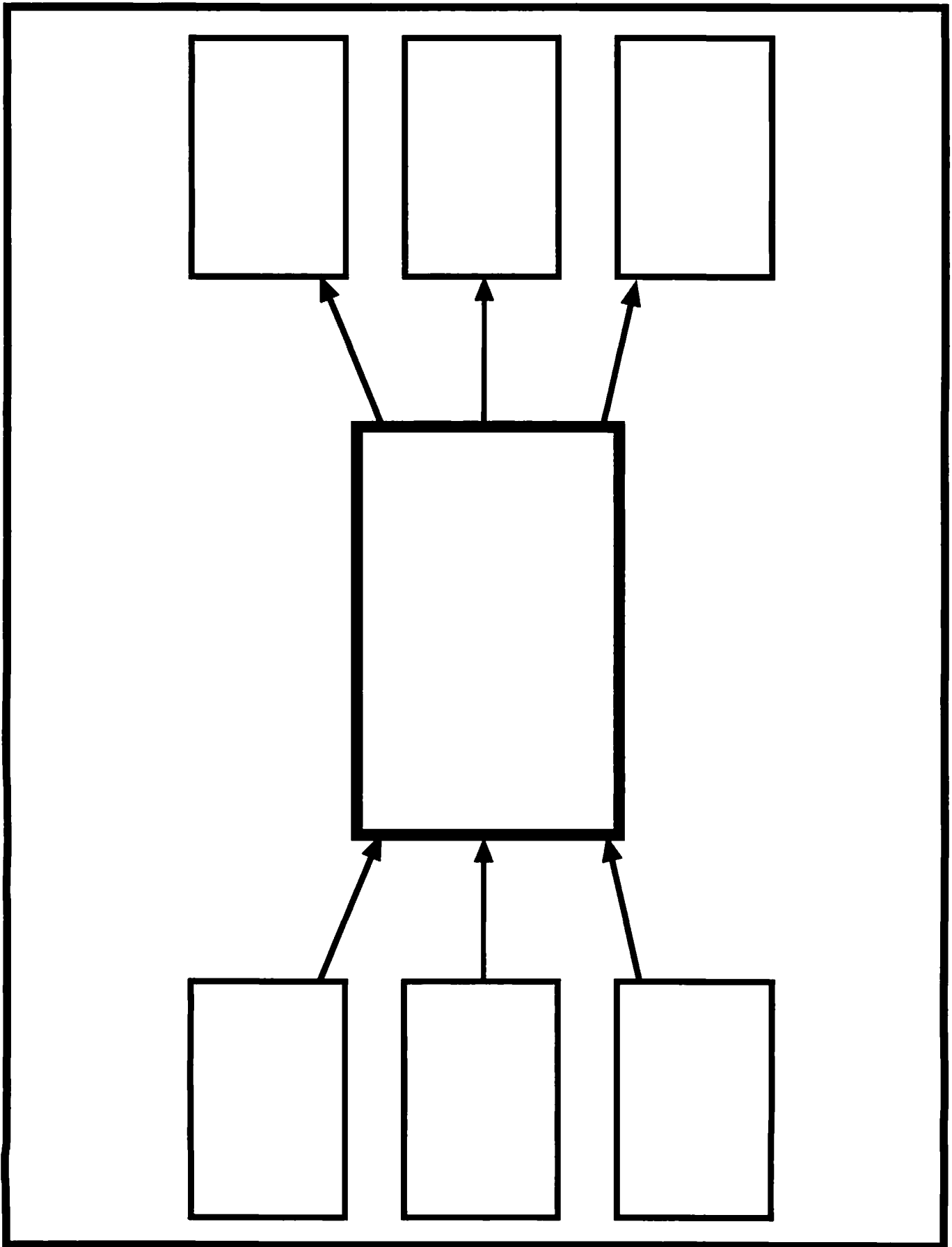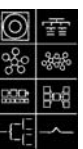**Bridge Map for Seeing Analogies**

Double Bubble Map for Comparing and Contrasting

Multi-Flow Map for Cause and Effect

Five Levels of Thinking Maps® Implementation

	1 Introducing the Knowledge Base	2 Teaching the Skills and Maps	3 Horizontal Transfer Across Disciplines	4 Vertical Integration	5 Executive Control and Assessment
STUDENT	● Is aware of the impending implementation	● Correctly applies and constructs all 8 maps with support ● Recognizes maps as teacher applies them in new situations ● Identifies appropriate TM in response to prompt or question	● Uses thinking process vocabulary ● Accurate and independent selection of TM for communicating thoughts and ideas in all subject areas ● Applies multiple maps to analyze and comprehend information for learning	● Uses TM in collaborative group work to expand, revise, and synthesize ideas ● Collaborative problem-solving ● Applies TM to homework, projects, etc., for a variety of purposes and through a variety of technologies, including TM software	● Fluid, independent use of language of TM across disciplines ● Uses TM for metacognition, self-reflection, and assessment ● Self-selected artifacts for student portfolio of Thinking Maps ● Novel applications beyond academic areas
TEACHER	● Has attended Day 1 TM training ● Established a plan for systematically introducing TM ● Has met with colleagues (grade level, content area) to review plans for implementation ● Discussed with students the plan for implementation	● Explicitly introduces and reinforces all 8 maps ● Models and applies multiple maps to demonstrate and introduce content and concepts	● Uses TM to guide questioning and responses ● Encourages and models thinking process vocabulary for transfer across disciplines ● Explicitly scaffolds map(s) for improvement of students' thinking abilities	● Uses TM in collaborative work for instruction and assessment ● Collaborative problem-solving and curriculum planning ● Uses TM in and for curriculum planning, cooperative learning, and assessment through a variety of technologies, including TM software ● Embeds Thinking Maps in other instructional strategies, structures, and initiatives	● Fluid use of map(s) in instruction and assessment ● Uses TM for metacognition, self-reflection, and assessment ● Self-selected collection and documentation of Thinking Maps integration ● Novel application to instructional opportunities beyond academic areas
ADMINISTRATOR	● Has a clearly developed plan to support TM implementation ● Uses TM for basic agendas or to display data such as agendas, roles (if leadership training has preceded TM implementation)	● Uses TM to plan and facilitate small and whole group meetings ● Models multiple maps to introduce and generate information about topics or issues	● Uses TM for coaching and supervision ● Uses TM for long-term planning and school improvement ● Encourages and models thinking process vocabulary for transfer across the learning organization	● Uses TM in collaborative work for instruction and assessment ● Collaborative problem-solving and curriculum planning ● Uses TM in and for curriculum planning, cooperative learning, and assessment through a variety of technologies, including TM software ● Embeds Thinking Maps in other instructional strategies, structures, and initiatives	● Fluid use of maps in collaborative problem-solving, coaching, and supervision, etc. ● Uses TM for metacognition, self-reflection and assessment ● School-wide documentation of applications across grade levels and disciplines ● Novel application to administrative duties
SCHOOL	● Leadership Team, including Trained Trainers, established to guide implementation ● All resources and TM software, if acquired, are distributed to faculty ● Central area established to share/display TM work	● Displays evidence of student, teacher, and administrator applications ● Parents are made aware of the implementation of the maps and opportunities are provided for them to become oriented to their use	● Sharing, discussing, and collecting map applications and media across all grade levels and positions to promote the school-wide common language ● Uses TM for school-wide data analysis and action planning	● Uses TM in grade level department, parent, and volunteer meetings for collaborative problem-solving ● Integrates TM as a tool within other communication frameworks through a variety of technologies, including TM software	● Fluid use of maps for communication between all members of learning community, parents ● TM technology used to facilitate higher order thinking across school ● School-wide assessment of implementation indicating patterns of use, growth and next steps ● Novel applications outside of school building (in the wider community)

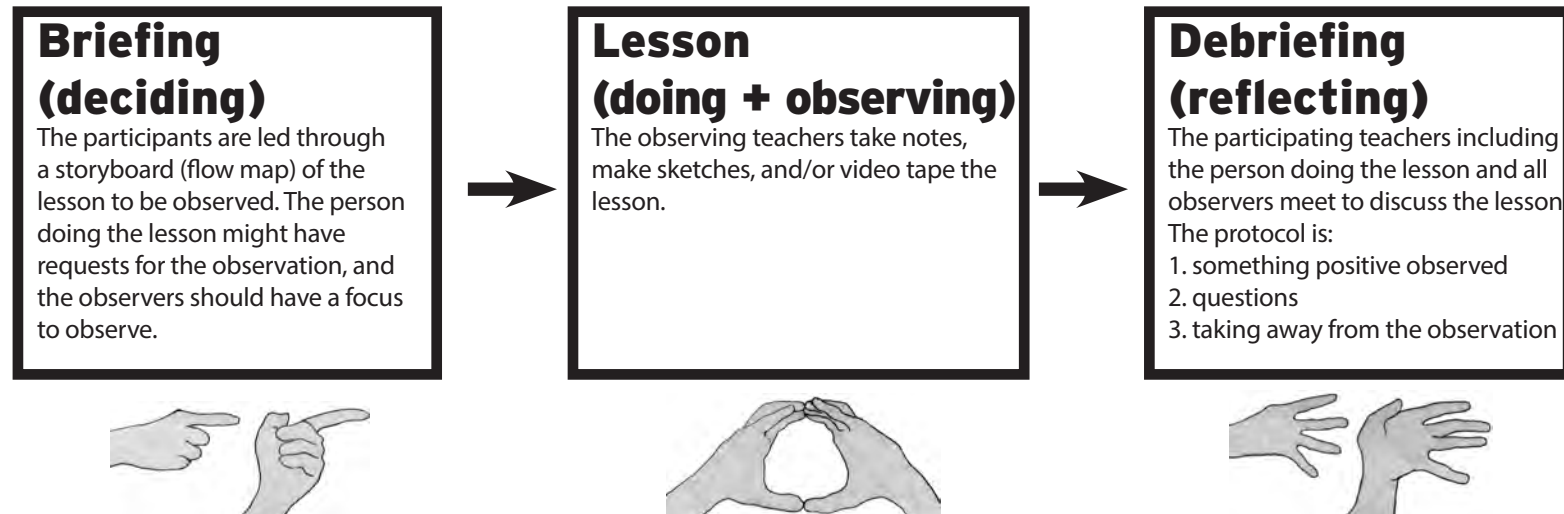### Collegial Coaching: Teachers Coaching Teachers

The Teachers Coaching Teachers model focuses on teachers regularly observing each other to learn, understand, and improve their pedagogy (teaching methods). This model works best in groups of three - one teacher demonstrating a lesson while two other teachers observe. The observed lessons are generally in the 15-30 minute range to provide a focus on particular teaching methods. The model includes a briefing, lesson and debriefing.

This model is a multi-directional process: everyone has gifts and skills to share and learn from one another. This differentiated process allows everyone to progress at a rate consistent with their skills. The model is an ongoing process for both new and experienced teachers.

Systems Model: This model is equally effective with administrators coaching administrators; facilitators coaching facilitators.

Ongoing Development: Teachers regularly participant with the Collegial Coaching model throughout the school year.

Process

Briefing (deciding)	**Lesson (doing + observing)**	**Debriefing (reflecting)**
The participants are led through a storyboard (flow map) of the lesson to be observed. The person doing the lesson might have requests for the observation, and the observers should have a focus to observe.	The observing teachers take notes, make sketches, and/or video tape the lesson.	The participating teachers including the person doing the lesson and all observers meet to discuss the lesson The protocol is: 1. something positive observed 2. questions 3. taking away from the observation

Building Community - Team Builders
Getting To Know You

Mingle
The group mingles around, casually talking to each other. As they continue mingling, you call out a name of a category, like pets. The players then have to find other people who have that in common with them. Other categories you can try are: someone with the same number of brothers and sisters as you, someone with the same color eyes as you, someone with one of your hobbies. Let one of the players take your place and be the leader who can call out the categories.

People to People
Everybody mingles around, greeting one another normally (thus the title "People to People"). You, as the leader, stop movement by proclaiming "elbow to elbow!" or "knee to ear!" The group must form whatever configuration you say by finding someone to touch elbows with or a knee to put an ear on. When you say "people to people," the mingling and greeting begins again. The game becomes more creative when you announce animal configurations, like "Elephant to elephant!" or "Snake to snake!" or "Alien to alien!" These can lead to "Trunk to trunk!" and "Tail to tail!"

In Common
Participants face the inside of the circle on their individual spots. One person (start with the teacher modeling several times, then each student will do it once) will state something true about themselves. An example might be "I have taken ballet lessons." Then everyone who has this "In Common" with the person who stated "I have..." will leave their spots and trade with someone else. This is followed by another person sharing something true about themselves. Then everyone who has this "In Common" with the person who stated "I have..." will leave their spots and trade with someone else.

I Love My Neighbor
Participants face the inside of the circle on their individual spots, except for one person, for example Jamal, who is "It" and stands in the middle. Jamal starts by saying "I love my neighbor who...," finishing with a characteristic or description, such as, "I love my neighbor who has an older brother." Then all the participants to whom this is true leave their spots and trade with someone else. Jamal then scrambles for the open spaces, and whoever is left without a seat is the new "It" and must begin again saying "I love my neighbor who..." Each person who is "It" is not allowed to repeat any of the other things previous "Its" have said.

Trust
Participants are in pairs. They will connect with hands (you could also do it with elbows, fingers, etc.). One person will close their eyes and the leader will keep their eyes open. They will then start walking together. It is the responsibility of the leader with the eyes open to lead the other person who is trusting them on a safe path while they are walking around. Initially do for short segments (e.g. 30 seconds), then have the pairs switch who is the leader.

Building Community - Team Builders
Whole Group Focus

Machine
The objective of the game is to create an abstract machine using people as parts. One person begins by making a simple motion and sound. The leader selects another person to join the machine - this person adds another motion that works in rhythm with the first person. The leader continues to select people who continue making simple motions and sounds that work in rhythm with the machine. The leader (or a person in the group) is *at the controls* that can turn the machine off and on, or speed the machine up and slow it down. The leader can be specific on what the machine does or makes.

Fruit Basket
The class sits in a circle on chairs. One person stands in the middle. The participants are equally divided between three fruits (e.g. apple, orange, and pineapples). When one fruit is called by the middle person (e.g. apples), all the apples change chairs including the middle person. The person 'out' becomes the next caller. If a *caller* says fruit basket all participants have to change.

Frozen-in-Motion
The leader and participants sit on their chairs. Initially have the participants feel the floor, feel the chair, and feel the space they are in. This can be done with eyes open or closed. The participants are then directed to feel and replicate an emotion (e.g. boredom, surprise, mad, etc.). The leader (teacher or student) then says *freeze*. Everyone then freezes as a statue. The leader now says 'we are now in the museum of _____.' Everyone is then asked to focus on one person who remains a statue. Have the viewers focus on a particular part of the *statue person*. Elicit vocabulary to describe different body emotions of the statue person. The vocabulary could be recorded to use on a word wall. This is an excellent exercise leading to a tableau for recreating a part(s) of a story to stimulate and generate discussion.

Group Rhythm
Form a circle and stand in a relaxed position. Everyone holds their arms out to the side in such a way that each person's index finger is touching the next person's index finger. In this way the whole group is connected fingertip to fingertip. The object of the exercise is for everyone to clap at the same time.
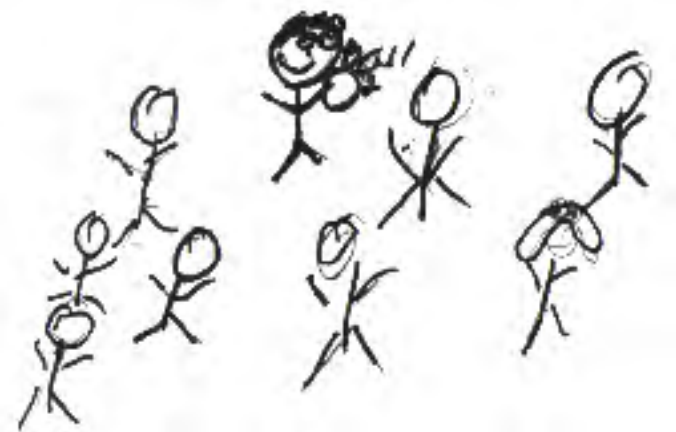
Building Community - Team Builders
Pantomime Games
Participants mirror each other in silence. This exercise has the participants focusing on each other to mirror the actions of the person modeling the movements. Initially, and periodically the teacher leads the mirroring activity to model effective movements. It is very important to regularly have students lead the mirroring. These exercises are very effective community builders that build collaboration and the ability to focus. They are excellent for transitions.

Group Mirror
One person stands facing everyone in the class. They can stand anywhere in the class. It is important everyone has a clear view of the person leading the movement. All participants should stand clear of any objects or furniture. The order of modeling could be: moving arms; moving arms and hands; moving arms, hands, and fingers; moving arms, hands, fingers, and head; moving arms, hands, fingers, head, and torso; moving arms, hands, fingers, head, torso, and elements of the head (e.g. the eyes). The person who is the *mirror* leads the participants for approximately 30 seconds, then says freeze, with all the *reflections* now a stop motion of their movements. Then upon hearing continue they continue the reflection of the mirror. Group mirror is very effective to quickly start with the students participating from wherever they are in the class.

Circle Mirror
The class, including the teacher stand in a circle allowing room for arm movement. The teacher can initially take the lead as the *mirror*. The person who is the *mirror* leads the participants for approximately 30 seconds (one student can be the timekeeper), then says freeze, with all the *reflections* now a stop motion of their movements. The mirror then selects another person to become the new *mirror*. The *reflections* now imitate the motions of the new *mirror*. The *reflections* now have a full view of the *mirror* allowing additional motions beyond those listed in Group Mirror including: moving up and down; moving legs and feet; and whole body movement. Circle mirror is excellent as a collaborative community builder with equal focus upon each other. It is very effective when students will be changing their location in the room. The circle could be formed at the location of the next classroom activity.

Duet Mirror
Very similar to exercises and actions in Circle and Group Mirror. The students would stand up and face a partner. Everyone, including the teacher (model), pair with someone in the classroom. They select a mirror person in each pair. They then start until they hear the word freeze in approximately thirty seconds (student timekeeper). The reflection now becomes the mirror. If there are an odd number of people in the class, there can be one group of three.

Detective
Conducted similarly to Circle Mirror. One person who is chosen as the *detective* turns around (or leaves the room). A person is selected to be the *mirror* without the detective hearing or seeing the selection. The *detective* is invited back into the circle and/or room, where they will try to determine who the lead *mirror* is.

Building Community - Team Builders
Focus and Concentration 1

Zoom
In a circle students orally pass the word *zoom* around from one person to another. The exercise moves rapidly to build and sustain community involvement. Extensions include switching directions, multiple zooms at one time, students leading zoom, use of different polygons to form the 'circle' (e.g. square), & other words to build vocabulary. Initially introduce with students sitting in a circle with their legs crossed, sitting up straight, and their hands in their laps. The students are modeled and asked to have their knees touching their neighbors knees to form a tight circle.

Zoom - EEK
In a circle students orally pass the word *zoom* around from one person to another. Introduce the word EEK to everyone—means stop and go the other direction. When the leader says EEK whoever has the zoom changes direction.

Movin' in Rhythm
Everyone forms a circle. It is helpful to hold hands when first learning Movin' in Rhythm. When in the circle everyone starts moving clockwise (or counter clockwise) together. The goal is to be moving like a smooth wheel going in a circle. The leader can be *at the controls* to control the speed of the wheel or turn it on and off.

Movin' Zoomin'
Everyone forms a circle. Movin' Zoomin' combines Zoom and Movin' in Rhythm together. First have the group Movin' in Rhythm, then start Zoom. When these two elements are successfully combined, add EEK.

In-Motion
Combines elements of mirroring and zoom that includes movement, sounds and moving in a circle. One person (initially the teacher) does a motion (movement and sound), then everyone repeats the modeled motion. Then another person in the circle does a motion followed by everyone repeating the modeled motion. The order could be determined from a caller who selects the next person or in order around the circle. In the beginning a suggested rule is to keep your feet on the ground and stay where you are standing.
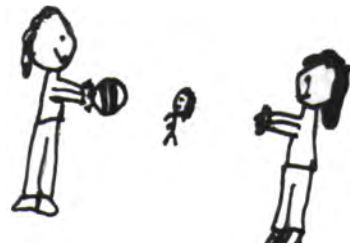
Building Community - Team Builders
Focus and Concentration 2
Pass the Rhythm
Everyone stands in a circle. One person begins by modeling a clap (the rhythm), then turns to a person next to them (we'll say to the left) and they must clap the rhythm together while looking at each other in the eyes. The person who just received the rhythm now turns to their left and does the same action with the person on their left. This continues until the rhythm returns to the person who began the rhythm.

Pass the Pulse
Everyone stands in a circle holding hands with their eyes closed. The leader is the generator of the pulse. The leader starts with passing the pulse by squeezing the hand of the person to their right or left. The person who just received the pulse is now the conductor and passes the pulse to the person on the other side by squeezing that person's hand. The pulse should travel around the circle a couple of times, with the leader passing it just like everyone else. When this pulse is traveling, you can send a new pulse. Then game ends when the leader progressively stop all of the pulses.

Pass the Motion
The group gathers into a circle and sits facing in. To begin, everyone extends their hands to the center of the circle with their palms up. The leader slowly curls their fingers, one by one, from the left to the right. Then, the person to their right curls their fingers up in the same manner, and then the next person in the group, and then everyone continues around the circle. The motion should pass smoothly and fluidly. After the wave returns to the leader, you can pass another motion (perhaps uncurl the fingers) and add a sound. Then, you can pass any other motions, like standing up, raising your hands above your head, jumping, or whatever you think of. As leader, you are in control of the energy level. If things get a bit too energetic, you can return to the original finger rolls.

Pass the Face
Everyone stands in a circle. Starting with the leader, they make a noiseless face to the person next to them. The second person mirrors the face back to the first person. Then, the second person turns from the first person melting away the mirrored face and making a new face as they face the third person. The third person mirrors the face of the second person. This continues around the circle. As the group improves, there should be no lag time between each passed movement.

Pass the Object
Everyone stands in a circle. The leaders begins with a single imaginary object. You establish, through physically modeling, what the object is. You then pass it to the person on your left (or right), who then continues passing it in the same direction.

Collaborative Learning Methods

The concept of collaborative learning, the grouping and pairing of learners for the purpose of achieving a learning goal, has been widely researched and advocated - the term "collaborative learning" refers to an instruction method in which learners at various performance levels work together in small groups toward a common goal. The learners are responsible for one another's learning as well as their own. Thus, the success of one learner helps other students to be successful. Proponents of collaborative learning claim that the active exchange of ideas within small groups not only increases interest among the participants but also promotes critical thinking. There is persuasive evidence that cooperative teams achieve at higher levels of thought and retain information longer than learners who work quietly as individuals. The shared learning gives learners an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers.

Collaborative Learning is a relationship among learners that requires positive inter-dependence (a sense of sink or swim together), individual accountability (each of us has to contribute and learn), interpersonal skills (communication, trust, leadership, decision making, and conflict resolution), face-to-face promotive interaction, and processing (reflecting on how well the team is functioning and how to function even better).

Think-Pair-Share
(1) The instructor poses a question or topic, preferable one demanding analysis, evaluation, or synthesis, and gives students about a minute to think through an appropriate response. This "think-time" can be spent writing, also. (2) Students then turn to a partner and share their responses. (3) During the third step, student responses can be shared within a four-person learning team, within a larger group, or with an entire class during a follow-up discussion. The caliber of discussion is enhanced by this technique, and all students have an opportunity to learn by reflection and by verbalization.

Three-Step Interview
Common as a team-building exercise, this structure can also be used also to share information such as hypotheses or reactions to a film or article. (1) Students form pairs; one student interviews the other. (2) Students switch roles. (3) The pair links with a second pair. This four-member learning team then discusses the information or insights gleaned from the initial paired interviews.

Learning Teams
Members of learning teams, usually composed of four individuals, count off: 1, 2, 3, or 4. The instructor poses a question, usually factual in nature, but requiring some higher order thinking skills. Students discuss the question, making certain that every group member knows the agreed upon answer. The instructor calls a specific number and the team members originally designated that number during the count off respond as group spokespersons. Because no one knows which number the teacher will call, all team members have a vested interest in understanding the appropriate response. The verbalization and the peer coaching helps all learners become actively involved with the material.

Robert Price • 1469 N. Delaware St • Indianapolis, IN 46202
VOICE 317.951.2275 • MOBILE 323.397.0630 • FAX 317.951.2271
EMAIL robert@eggplant.org • WEBSITE www.eggplant.org

Collaborative Learning Methods continued
Read-Talk-Map
Read

The first step is having the students read or listen to the same selection: silently reading a selection to themselves; listening to a selection to the class. The selection can be non-fiction or fiction.

Talk

After finishing reading or listening to a selection, the students are paired up with an A and B designation. It is important that the paired students are physically facing each other during the Talk phase. The A student begins the process by sharing everything they know about the selection they read (or listened to) while B listens. Then they are instructed to switch their roles after a specified amount of time. The B student shares everything they know about the selection to A including anything new or what they have previously heard. It is helpful to provide a specified amount of time (an unusual number such as 23 seconds is very effective). A timer can be effective. It is important for the student sharing to keep speaking if they are the student talking. Before students are paired the teacher could pair with a student to model the procedure to the whole class. This provides a platform to model how one thinks.

Map (Draw; Perform; Write)

After completing the Talk phase, students then map (or draw or perform or write) what they have learned from the Read and Talk elements of the porcess. They map without looking at the text they just read or listened to.

Simple Jigsaw

The facilitator divides an assignment or topic into four parts with all students from each Learning Team volunteering to become "experts" on one of the parts. Expert Teams then work together to master their fourth of the material and also to discover the best way to help others learn it. All experts then reassemble in their home Learning Teams where they teach the other group members.

Collaborative Visual Mapping

Using visual cognitive maps (e.g. Thinking Maps) as a collaborative tool for thinking and understanding concepts, ideas and frames of reference.

Question Game

To start the question game the two participants must initially decide on a topic to question. One person starts with an open ended question, then the other person responds with a related open ended question. This continues back and forth with the two participants. Pairs can then share with small groups and/or the whole group.

An example is:

Topic: (e.g. object in the room) light bulb

Questioner A: How does a light bulb work?

Questioner B: Who designed the current light bulb?

Questioner A: Who invented the light bulb?

Questioner B: Why would someone invent the light bulb?

Questioner A: How can we improve the light bulb?

Sequencing in Silence

Please refer to the specific handout.

Robert Price • 1469 N. Delaware St • Indianapolis, IN 46202
VOICE 317.951.2275 • MOBILE 323.397.0630 • FAX 317.951.2271
EMAIL robert@eggplant.org • WEBSITE www.eggplant.org

Interpretive Questions for Compehension

When exploring any type of text (fiction, non-fiction, poetry) it is important to ask interpretive questions that build upon one another. Interpretive questions are effective both with well planned discussions and in spontaneous situations. Interpretive questions stimulate comprehension, oral language, and written language.

Types of Questions

Factual - A factual question has only one correct answer.

Interpretive - An interpretive question has more than one answer that can be supported with evidence from the text. Interpretive questions keep discussions going and require the reader to refer back to the text.

Evaluative - An evaluative question asks the reader to decide if s/he agree with the writer's ideas or point of view. The answer to an evaluative question depends on the reader's prior knowledge, experience, and opinions.

Writing Interpretive Questions

Character motivation (why a character does something). Developing an interpretive question to discover the reasons behind a character's statements, actions, &/or thoughts.

Interesting use of language. An interpretive question used to develop discussion on how the author expresses an idea or creates a description. Some details in the story can function as important elements in an interpretation. The answer cannot be simply resolved from a dictionary.

Plot. Well written stories have plots that are interconnected with the various parts supporting one another. An interpretive question can help discover the meaning and relationships between its parts.

Key words. To start a question include how, what, where, why, and when.
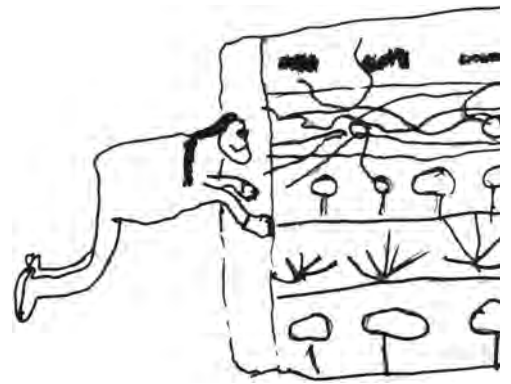
Testing the Questions

There should be genuine doubt about the answer(s) to the question.
If a question is open to different possible answers students will be more willing to share their thoughts.

You should have genuine interest in the question.
Students will 'read' your interest (or lack of) in the question and story.

The question should stimulate discussion.
The question should create an interest in revisiting the story for evidence.

The question should be clear.
The participants should easily understand the question.

The question should be specific.
The question should fit the story and not generic to any story.

Leading a Discussion

Here are the basic ground rules for leading a discussion:

1 - Participants must have read or heard (read aloud) the story.
2 - Discussion is focused on the selection everyone has read or heard.
3 - Opinions should be supported with evidence from the story.
4 - Leaders only ask questions – they do not answer them.

For a discussion based on interpretive questions to be successful, student interest needs to be encouraged and valued.

Prepared and Spontaneous Questions

To create effective questions and questioning techniques it is very important to develop and test the questions prior to discussing the story with the class. To facilitate quality questions it is beneficial to take notes when initially reading the story. Writing Interpretive Questions provides a template of the types of notes to help develop quality questions. After writing questions from your notes have another person read the story and try the questions out on them. This will provide an opportunity to test the Testing the Question criteria.

Spontaneous interpretive questions are an important part of all discussions. Experience with preparing questions and using interpretive questioning techniques support spontaneous questioning.

The Question Game

To start the question game the two participants must initially decide on a topic to question. One person starts with an open ended question, then the other person responds with a related open ended question. This continues back and forth with the two participants. An example is:

Topic: (e.g. object in the room) light bulb
Questioner A: How does a light bulb work?
Questioner B: Who designed the current light bulb?
Questioner A: Who invented the light bulb?
Questioner B: Why would someone invent the light bulb?
Questioner A: How can we improve the light bulb?

Resources

Junior Great Books, Great Books Society – Shared inquiry for K-12 and adults. Great for questioning skills – whether using their books or others the workshops are fabulous for strategies. www.greatbooks.com
No Contest, Alfie Kohn – Excellent book on collaborative learning. Houghton Mifflin.
Content Area Reading, JoAnne & Richard Vacca, Little, Brown
Mosaic of Thought – Ellin Oliver Keene & Susan Zimmerman, Heinemann

Powerful Questions

The Powerful Questions technique is used to build comprehension, inferential thinking, listening skills, understanding, and interest. Either an object or image are used as the focal point for questions. After the object or image have been revealed, the students initially observe the object or image, then share questions from their observations. This technique develops inquiry skills while enhancing observation abilities. It is important that no questions are answered during the exercise. Ultimately quality questions frame deeper answers and understanding. An extension is *The Question Game* as used by journalists.

Object or Image
Either an object or an image work well for this exercise. When presenting an object refer to it as a common object (or similar generic term). This stimulates enhanced observation skills, especially when an object might be several different things. With an image or photograph, it is best to choose one that has some unknown to it (e.g. a half built igloo - is it being built or taken apart?). It is an excellent tool to use an image from a text or book that is being studied as an introduction. Newspapers are also an excellent source of images which becomes an excellent anticipatory set prior to reading the article.

Order of Technique
1—State *you will be shown a common object (or image) which we'll ask questions about*. Initially they will be shown the object (or image) and quietly observe it. The students could closely gathered around the object, the teacher could be walking around the room, or each small group could have one of the objects. The students are informed we will only ask questions— they then start presenting their questions. It is best the teacher doesn't repeat the questions, instead having the students repeat their own questions so the focus is on them and they hone their presentation skills. They will be able to see the object or image throughout the time they are sharing questions. An extension is pair/share or small group sharing of questions prior to whole group sharing. This could also be done during the technique to further develop questions.

2—If the object or image is something they are studying, the questions might be recorded on poster paper. In higher grades two students would write the questions and in lower grades the teacher would write the questions. The person(s) who asked each question might also be noted next to their question to honor them when using the questions during a later study.

3—The teacher never provides answers and only occasionally asks a question themselves. They might ask a question to offer a new direction, different frame of reference or a deeper extension. e.g. *about the perspective of who took the photograph* or *who invented/designed an object*.

4—Reread all the presented questions to that point several times during Powerful Questions. This recap honors the presented questions while stimulating ideas for deeper inquiry.

5—Excellent precursor to using a Panoramic Book (see handout on). Select an image or photograph from the Panoramic Book that provides an element of the unknown to stimulate curiosity and interest. Powerful Questions are also excellent used with visual mapping to see, reflect, and assess the thinking of the group and participants.

Depth and Complexity

The following methods are effectively used as part of the thinking process with visual tools and inquiry. Please reference the handouts on Thinking Maps, Frame of Reference (with Thinking Maps), Collaborative Learning, Powerful Questions and Shared Inquiry.

Note Details
elaborate; identify attributes; note the parts; important factors

Identify The Rules
state the explicit or implicit factors that affect an area of study; the structure; the order; the hierarchy; the elements that set the standards

Observing Patterns
identify reoccurring elements and events; determine the order of events; predict what comes next

Recognizing Trends
note factors that cause events to occur (social, political, economic, geographic); identify patterns of change over time

Identify Ethical Considerations
determine elements that reflect bias, prejudice, discrimination; state observations and arguments in terms of ethics

Powerful Questions
use questions to: identify unclear ideas or missing information; discuss areas yet to be explored or proven; note conclusions that need further evidence or support

What is the Generalization, Principle, Theory or Big Idea
identify a rule or general statement that summarizes information or draws conclusion based on evidence drawn from a collection of facts or ideas

Relationships Over Time
describe relationships between past, present and future; relationships within a time period; how or why things changed or remained the same

Multiple Frames of Reference (Perspectives)
discuss multiple perspectives related to area of study; explore different viewpoints; reflect on diversity within a society

Interdisciplinary Connections
relate and integrate the area of study to include the methodology of other disciplines