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INTRODUCTION

The strategies in this book come from a variety of sources. Some are relatively new and have been described by their originators elsewhere in greater detail. Others are related to the excellent thinking practices of earlier generations of teachers and appear here as re-inventions or revisions of those earlier strategies. All are used regularly by NUA consultants in their work in the schools of member districts. As a collection, the strategies give teachers the tools they need to help students navigate the territory of thinking.

THE TERRITORY OF THINKING

The territory of thinking includes modes of thinking, purposes for thinking, and specific thinking skills that can be employed. We'll elaborate on these briefly to suggest the kinds of thought that are incorporated in the strategies in this book.

Modes of Thinking

Modes of thinking are ways of thinking, the kinds of mind-sets that we employ for different purposes. Critical thinking is one example of a mode of thought. When we think critically, we examine something closely in order to make judgments about it. For instance, we listen carefully to an argument and identify the weak links in the speaker's train of reasoning, or we read a text with an eye to identifying the author's underlying assumptions, or we look at a painting to critique the artist's composition or use of color. Creative thinking is another mode of thought. When we think creatively, we want to generate a variety of ideas, come up with a novel point of view, or "think out of the box." What mode of thinking we use depends on our purpose.

Purposes for Thinking

We have many different purposes for thinking. For instance, we might need to think carefully in order to solve problems, make decisions, play challenging games, plan an endeavor, or figure out the best way to implement a plan. Each purpose may include one or more modes of thinking. For example, solving a problem requires identifying or defining the problem, generating possible solutions, selecting one to try, and then noting if it worked or if another solution needs to be tried. At each stage, we might have to shift our mode of thinking to be most effective. That is, we might think creatively to generate a number of possible solutions (being more concerned with quantity than quality at first) and then think critically about each solution to select the best one to try first. As we employ different modes of thought for different purposes, we will also use a variety of specific thinking skills.

Thinking Skills

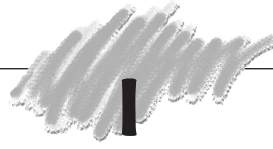
The specific skills of thinking include such processes as observing, analyzing, comparing and contrasting, synthesizing, constructing meaning, and seeing relationships (to name only a few). These skills can be named as specific entities, but they are most often used in close coordination with one another. For instance, in order to compare and contrast two objects, one must observe them carefully in order to note where they are similar, where different. Such skills are invariably developed and refined in the context of accomplishing some specific purpose. To elaborate further, following are a few ways in which some specific skills might be used for different purposes while employing different modes of thought:

Observing

Consider looking at clouds. You might look creatively to discern animals or faces or shapes. Or you might look critically to determine what weather patterns are forming, given what you know about the relationship between cloud shapes and weather phenomena.

Comparing and contrasting

Consider comparing two different pieces of music, such as an 18th-century sonata and a contemporary rock song. You might make a critical comparison that would focus on the technical elements of the works (the tempo, the instrumentation, the use of refrains, etc.).



ANALOGIES



STRATEGY-AT-A-GLANCE

STRATEGY OVERVIEW

An analogy is a way of stating a relationship between things. Studying and creating analogies can help students develop personal understanding of the various ways things can be related to one another. Tadpole is to frog as kitten is to cat is an example of an analogy. Analogies can also be represented in the following way:

Lincoln : president :: Henry VIII : king

which is the standard convention for identifying an analogy and is a kind of shorthand way to express that Lincoln is to president as Henry VIII is to king.

INSTRUCTIONAL BENEFITS

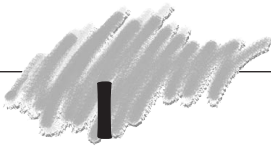
- helps develop student understanding of the nature of various kinds of relationships
- refines students' understanding of the specific vocabulary and concepts that are used in the analogies
- develops higher-order thinking abilities in students
- expands student vocabulary

BEFORE, DURING, AFTER . . . ANYTIME

- before a lesson or unit to introduce vocabulary and concepts
 - after a lesson or unit to refine and extend vocabulary and concepts
-

Strategy Step-by-Step

The steps described below are best done in the sequence given here, but you may want to take several days or more to go through all the steps.



1. Have students brainstorm pairs of words that are related or associated in some way. Examples follow:

day	night
mother	daughter
wheel	bicycle
cake	frosting
bird	beak
acorn	oak

2. Have students state the relationship between the items in each pair. Building on the example above

day/night:Day is the opposite of night.

wheel/bicycle:A wheel is part of a bicycle.

cake/frosting:Frosting is something that goes on top of cake.

acorn/oak:An oak grows from an acorn.

3. Choosing analogous pairs that will likely be the easiest with which to work, have students think of other pairs that are related in the same way and list those alongside the pairs ordered in the same way.

day/night:up/down, cold/hot, front/back

cake/frosting:toast/jam, wall/paint, hair/hairspray

wheel/bicycle:leg/chair, eraser/pencil, bristle/brush

4. Model for students how to show the relationships using the conventions of a formal statement of analogy. Make sure students understand that the ordering of the items on each side of the “equation” is important.

cake : frosting :: toast : jam (NOT cake : frosting :: jam : toast)

wheel : bicycle :: leg : chair (NOT wheel : bicycle :: chair : leg)

5. To reinforce the kind of thinking that’s required for analogies, have students also write out how the items are related.

cake : frosting :: toast : jam

Cake is covered by frosting as toast is covered by jam.

wheel : bicycle :: leg : chair