THE THINKING OPERATIONS

There are numerous taxonomies which attempt to break thinking down into different skills or levels of cognitive functioning. Perhaps the labels are not as important to the teacher as the understanding that thinking is a complex activity which demands a variety of skills. Like the skills involved in movement, speech, reading and writing, thinking skills need practice. The teacher who wishes to develop students' thinking abilities needs to understand what kinds of skills are involved and to design opportunities for students to practise them in the classroom.

In the book TEACHING FOR THINKING, Raths and his co-authors describe a selection of operations which require students to engage in thinking at higher cognitive levels. These operations provide a helpful list for planning classroom thinking activities and evaluating students' thinking skills. Activities based on these operations may relate to specific subject matter in one curriculum area, or may link a number of curriculum areas. Using these thinking operations can help students understand the "big ideas" or major concepts in the school curriculum.

OBSERVING: using the senses to collect information about one's environment; studying objects or experiences in detail.

COMPARING: identifying similarities and differences among two or more item

CLASSIFYING: examining an assortment of items (including ideas) and sorting them into related groups according to their similarities and differences.

IMAGINING: using inner resources of inventiveness to create, fantasize, or visualize experiences which are not present; creating mental images in detail.

HYPOTHESIZING: developing a variety of possible explanations for phenomena in past, present or future.

EVALUATING: criticizing, making judgments, or offering opinions based on formulated criteria.

IDENTIFYING ASSUMPTIONS: differentiating between what is observably true and what is taken for granted as true.

COLLECTING AND ORGANIZING DATA: identifying sources of information, locating information, examining and culling relevant data, and developing procedures for the assembling of data.

SUMMARIZING: condensing the core meanings from a body of data.

CODING: developing short-hand methods for summarizing and presenting data.

INTERPRETING: explaining the meaning of an experience.

PROBLEM-SOLVING: identifying and defining problems, collecting and organizing data, generating and testing hypotheses about the nature and source of the problem; suggesting a variety of possible solutions and predicting their consequences, developing action plans, and evaluating results of problem-solving activities.

DECISION-MAKING: choosing among alternatives, examining the beliefs, attitudes and feelings which lie behind the choices made, and evaluating the consequences of personally made choices.