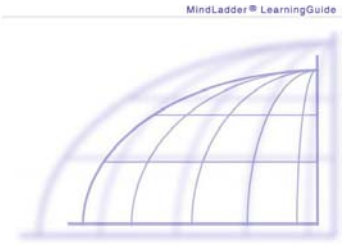

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T-10: Sequencing, Classification and Categorization

This knowledge construction function enables learners to order or group objects or events. Sequencing is the mental process of arranging elements in a progression according to some attribute or criterion such as size (as big, bigger, biggest), or time (as first, second, third). Classification is the process of sorting into groups (classes) when there is no relative ordering between them. For example, people can be classified by gender into groups of male and female or classified by origin into groups representing different countries. The terms classification and categorization are often used interchangeably. Categorization is sometimes used to describe subdivisions within a class. For example, dogs, cats, cows and horses are categories within the class of animals.

You can see now why comparative behavior (T-9) is such an important knowledge construction function because without the ability to discover likenesses or differences, one could not sequence, classify and categorize. Sequencing, classification and categorization serves, in its own right, as a prerequisite for other important knowledge construction functions. For example, some forms of inferential thinking are based on reasoning that involves classes (T-17). This function also facilitates the development of many skills in memory, reading, writing, math and as well as metacognitive skills. For example, it is easier to remember things that are grouped together; it is easier to remember eight grocery items if I can group them into categories such as fruits and vegetables: "I have three fruits to remember and five vegetables." Younger children (7-11) can order actual objects and events while older children (12 and above) in addition to grouping and ordering actual things, can generate and order within abstract classes. For example, young children can group different blocks or pencils while older children can group people according to their personalities or temperament. As with all developmental guidelines, remember they may vary with individual

children; you may have students younger than 12 who can generate abstract classes.

Children need to know language concepts and words such as big, bigger, and biggest and long, longer, longest. Concepts such as less than (<) or greater than (>) are needed and are sometimes difficult for students. Words such as first second and third must be understood. Developing these concepts through experiential hands on activities will enable your students to better understand the process of ordering and grouping. Also, whenever students are sequencing, they must hold two relations in mind simultaneously. That is, for example, an object is smaller than one and larger than another object *at the same time*. A student who has difficulty with the simultaneous use of multiple sources of information (R-10) will have difficulty sequencing. You can begin to see how the knowledge construction functions are used together and how one can support another. In order to group and order one may need, for instance, verbal tools and concepts (R-6), systematic exploration (R-7), careful attention to detail (R-9), simultaneous use of multiple sources of information (R-10) and comparing (T-9).

Some activities to mediate this knowledge construction function include:

(1) having students order objects or events according to time or size or degrees. For example, with time, you might have students arrange a time line of historical events in their chronological order, or a time line of events that took place in the student's family history, or develop a science project with successive activities ordered along a continuum of time. With size, you might have students arrange objects from smallest to largest or arrange cities, states or countries according to the magnitude of their population.

(2) Having students order into groups, classifying and categorizing. For example, in a science project, students might have to group insects, birds, animals or plants into classes with particular attributes. Or select several different classes, list a few members of each class and let the students discover what the critical attribute is for each class. For example, plants, tropical fish, endangered species, occupations, civil wars, languages and so on.

There will be many opportunities across academic subject areas and projects to focus on sequencing, classification and categorization. You can make the tasks as simple or as complex as needed for your students to practice this knowledge construction function. You may be able to embed the use of the function within projects, riddles and

problem solving contexts where curiosity and school work come together. "Classify the whole numbers from 1 to 20 as prime (Group A) and non-prime (Group B). Categorize the numbers in Group B into numbers whose square root is a whole number (Group B1) and numbers whose square root is not a whole number (Group B2). Categorize any prime numbers in Group B1 into Group B1.1. Compare Groups A and B1.1. The sum of the numbers that occur only in Group A pinpoint the year in the 18th century when our mystery event took place. You will need this number to solve the next part of our riddle". Use opportunities across the curriculum to continue to improve your students' understanding of this knowledge construction function and their ability to use it with increasingly complex problems and abstract content.

Have your students identify and discuss different uses of the knowledge construction function of classification (e.g. animal and plant taxonomies, the periodic table, the phone book, sales catalogues). Have them identify and discuss different usages of this function in their own school and community environment (classification of schools into elementary, middle and high schools with a sub classification into grades; the layout of a supermarket, the divisions of a company (e.g. research & development, accounting, marketing, sales, management).