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Analogical Anchoring: Part One

Enhancing the meaningfulness of content

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One goal of researchers at the University of Kansas Center for Research on Learning has been to develop and research teaching procedures for content teachers to use when presenting information to students who are not using effective and efficient learning strategies. This is the focus of the series of teaching guidebooks developed as part of the Content Enhancement Model. The goal of the teaching procedures in the Content Enhancement Series is to effectively mediate learning while compensating for the fact that there is some material that the student cannot learn independently. In general, the guidebooks in the Content Enhancement Series consist of teaching routines that are used to enhance the meaningfulness of content by helping students to organize, understand, remember and believe in the importance of the information. The Analogical Anchoring Routine is one example of such a procedure. Before using the Analogical Anchoring Routine, teachers need to become familiar with the following areas: 1) the meaning inherent in the term, 2) the content demands, 3) the students' needs which require the use of the routine, and 4) the development of the device associated with the Anchoring Routine, the Analogical Anchoring Table. These areas involve familiarization and planning prior to the use of the Analogical Anchoring Routine in the classroom.

The Meaning of "Analogical Anchoring."

Although we often shorten the name of the Analogical Anchoring Table to "Anchoring Table," both words in the title of this Content Enhancement Teaching Routine are important. We must first focus on the development of a

relevant "analogy," that is, a correspondence in some respect between things that are otherwise dissimilar. Second, we must use that analogy carefully in order to "anchor" new, unfamiliar, difficult information to familiar information. This mental anchor, just like a boat anchor, is used to provide a point of support for a new concept. (Note that on the Anchoring Table on page 2, the science concept "warm-blooded animals" is taught using a familiar concept, modern homes.) The use of a mental anchor gives the student a sense of stability and support while learning something new. This allows new learning to be incorporated into what is already known. As a result, the new information is anchored in the student's knowledge base rather than being free to drift away and never become meaningful.

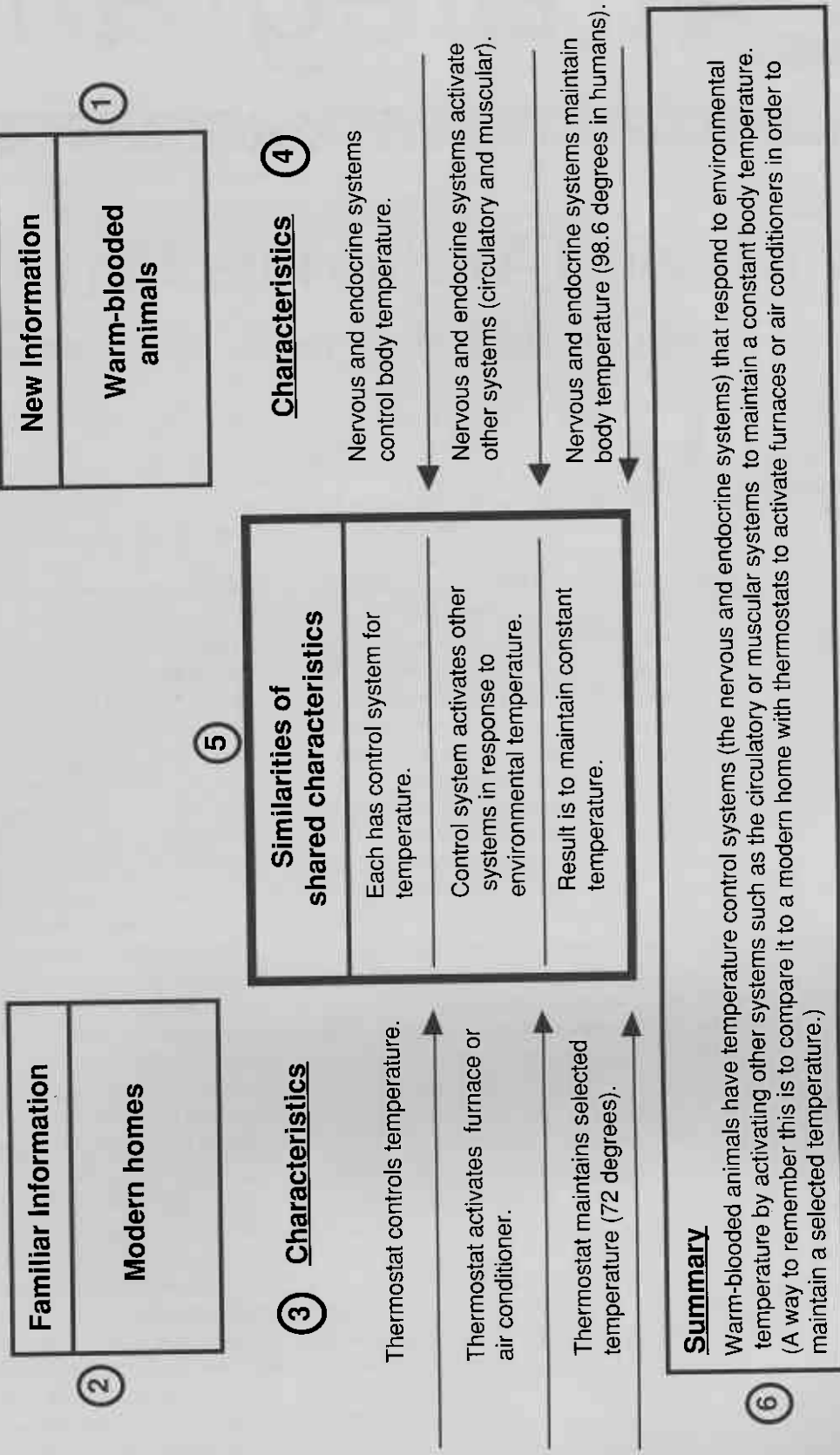
Content demands and student needs.

The Analogical Anchoring Routine has been designed with both content demands and student needs in mind. First, it should be used for concepts that are important but difficult to understand. The Analogical Anchoring Routine has been designed for teachers to use when they want to teach a new, difficult concept to students by building on students' prior knowledge about a familiar concept. For example, the concept of "warm-blooded animals" developed in the Anchoring Table on page 2 is an important science concept that is used frequently and one that teachers need in order to discuss a wide variety of science topics meaningfully. Second, it should be used when it is very likely that some students in the class have no prior knowledge of a concept or have an inadequate knowledge base to use in understanding the new concept. It is therefore

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"This mental anchor, just like a boat anchor, is used to provide a point of support for the new concept."

ANCHORING TABLE



Created by Janis Bulgren, KU-CRL, 3-91. May be reproduced.

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critical that teachers select a concept as an analogy with which all students are familiar. In this example, "modern homes" has been selected to develop the analogy. This is useful for two reasons: first, it is familiar to most students, and second, it shares meaningful characteristics with warm-blooded animals.

Development of the Analogical Anchoring Table

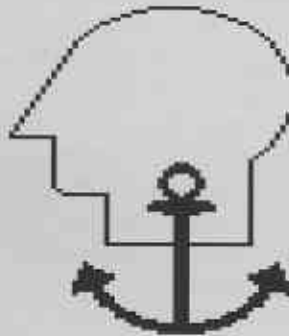
The Analogical Anchoring Table is a graphic instructional device for teaching a new concept by comparing it to a familiar concept. It is a teaching device that facilitates understanding by building a knowledge base for new information from familiar information. It does this by focusing on similar characteristics of two items. The teacher must carefully construct the Analogical Anchoring Table prior to using it in class. All six steps that are cued with numbers on the Analogical Anchoring Table should be included as the Anchoring Table is used. Although the Anchoring Table contains numbers that are guides for presenting the new concept to the students, the actual development of the table by the teacher will occur in a different order. The teacher must analyze the characteristics of the new information prior to selecting a familiar concept. Only by first determining the critical characteristics of the new concept can

"The Analogical Anchoring Routine has been designed with both content demands and student needs in mind."

an effective analogy be selected. For instance, only by focusing on the characteristics of a warm-blooded animal can characteristics of a modern home be selected for use in the analogy. Therefore, in order to develop the Analogical Anchoring Table teachers will need to use the

following steps from the figure on Page 2 labeled as **one, four, two, three, five, and six.**

First, select the **new information** that will be taught. The concept name is the word or group of words used to identify a concept. A concept is an understanding shared by people about things, ideas, events, or processes that share critical characteristics. The name of the concept is always placed in the rectangle at the top right side of



the Anchoring Table. **This is labeled with the number "1."**

For students with learning disabilities, the use of a recognizable format with visual and well as verbal signals may serve to enhance learning. In this case, the words "warm-blooded animals" appear in the rectangle labeled "new information." Teachers often want to teach this concept because an understanding about warm-blooded animals is a much more complex concept than implied by the words "warm-blooded." In fact, the simple description "warm-blooded" may lead to false understandings on the part of some students. Teachers want students to understand that "warm-blooded animals" have bodily control systems that maintain body temperature in response to changes in the environment. Therefore, students must be led to understand that the term "warm-blooded" has complex implications regarding the process of body temperature control.

Second, identify the **characteristics of the new concept** selected as the "new information." **This information is placed in the**

area labeled "characteristics" under "new information" and cued with the number "4." A characteristic is an identifying feature, quality or trait of the concept. In exploring concepts, teachers must realize that there are many types of characteristics. Picking the critical characteristics that the teacher is interested in teaching about the new information is most important. It is important to differentiate between characteristics that must always be present in all members of a concept group from characteristics that may sometimes be present in the concept, but are not critical to understanding the essence of the concept.

For example, there are many characteristics of "warm-blooded animals." However, teachers should focus on a few key characteristics such as the fact that in warm-blooded animals the nervous and endocrine systems act as control systems for body temperature. These systems in turn activate changes in other systems to control and maintain body temperature when the environmental

"For students with learning disabilities, the use of a recognizable format with visual as well as verbal signals may serve to enhance learning."

temperature changes. One warm-blooded animal, the human, has a body temperature of 98.6°.

Third, select the name of the **familiar information** that will be used to teach the new topic. **This information is placed in the area labeled "familiar information" and cued with the number "2."** Find a concept about which all members of the class have knowledge. For the Analogical Anchoring Table to work, look at the characteristics in the new concept that are critical to understanding. Remember that in planning the Anchoring Table,

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several items of familiar information may be considered before finding the one that works best to teach the new information. For example, "modern homes with heating and cooling systems" may be one good analogy. Some teachers may find others that they favor.

Fourth, check to be sure that the **characteristics of the familiar information** are characteristics corresponding to those that have been selected as most critical for the students to understand about the new concept. **This information is placed in the area labeled "characteristics" under "familiar information" and cued by the number "3."** Be certain that the familiar concept provides a good way to anchor characteristics of the new information to characteristics of the familiar information. Check that the familiar concept possesses all the necessary characteristics corresponding in meaningful ways to

those of the new information. Teachers should develop the analogy as fully as is necessary to permit student understanding.

For example, for temperature control, modern homes have a thermostat. This control system, in turn, activates furnaces or air conditioners depending on the outside temperature, and a constant temperature can be maintained in the home. These three characteristics of the familiar information correspond nicely to the three characteristics of the new information that has been chosen: body temperature is controlled by nervous and endocrine systems; changes in other body systems are activated by the nervous and endocrine systems; and the body temperature is maintained at a constant temperature.

Fifth, name the similarities between the characteristics of the concept identified as new information and the characteristics of the concept picked as the familiar information.

Do this by developing the central box on the Anchoring Table labeled **"Similarities of shared characteristics."** **This information is cued with the number "5."** For students to be able to learn a new concept through an analogy to a familiar concept, be very specific.

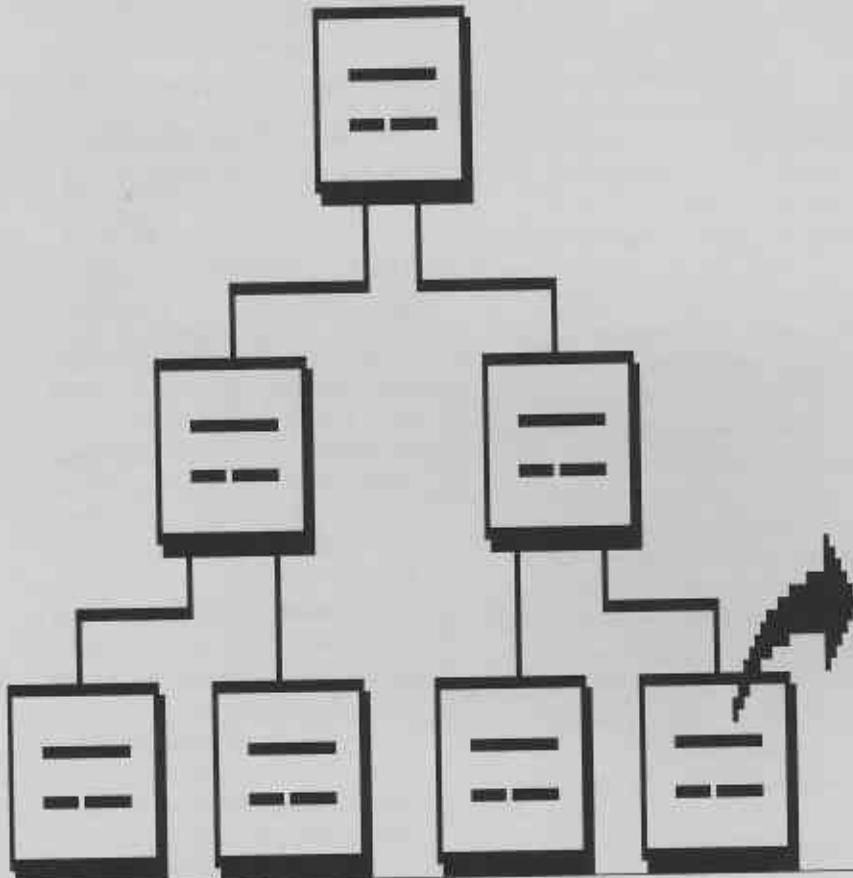
For example, warm blooded animals and modern homes with

"...think about how to involve them (students) in identifying the similarities of shared characteristics."

heating and cooling systems both have the following shared characteristics: control systems that respond to environmental temperature; control systems that activate other systems to respond to environmental temperature and the maintenance of a constant temperature. Explore carefully how each parallel set of characteristics is really similar. Think about using the Anchoring Table with the students, and how involving them in identifying the similarities of shared characteristics.

Sixth, construct a **Summary** of understanding about the concept identified as new information. **This information is placed in the area labeled "summary" and cued with the number "6."** A good summary is a statement that names the new concept and identifies all of the characteristics that must always be present in examples of the concept. Try to make the Summary a good definition of the new concept learned by including the name of the concept and all of the key characteristics. Plan to involve the students in constructing this summary statement.

In the next issue of *Strategram*, Vol.5 No. 5, the implementation of the Analogical Anchoring Routine will be presented. The article will deal with presenting the table to the students. ●



Sharing Responsibility for Student Diversity

by

Luanne Todd, SIM Trainer, NSSEO, Mt. Prospect, Illinois

It was March, 1992. Maribeth Westlund's senior social science class was beginning to count down the days to graduation. Lethargy was setting in. Among the students in her class were students with visual impairments, behavior disorders, learning disabilities, and students learning English as a second language—a diverse class to be sure.

How could I support Maribeth in meeting the needs of this diverse class? More Inservices? In the past, I facilitated training in learning strategies training in this school district. I worked with special education teachers to develop programs based on teaching learning strategies. Now I began to think more about the role of the general educator. As I faced the dilemma of helping general educators face the challenge of teaching in the face of increasingly

components of the content are maintained and are not watered down; 3) the focus of adaptations is on the selection, organization, manipulation, and transformation of the critical content components in a manner that promotes effective and efficient learning; 4) the adaptation promotes active learning partnerships between the teacher and the students for the involvement and benefit of all students in the class.

Second, I decided to use an inservice format similar to the Cooperative Study Group process that the KU-CRL has used for the past four years to promote self-guided professional development among general education teachers. The Cooperative Study Group process involves the following:

- 1) Teachers are **invited**, not forced, to participate.
- 2) The agreed upon goal of the study group is to “study” or identify problems and propose solutions to be tried by the group or by individuals in the group.
- 3) The group is led by a facilitator familiar with interventions and issues related to inclusion and group instruction. This facilitator assumes the role of colleague and collaborator (rather than trainer).
- 4) The group meets regularly, usually every few weeks for one or two hours to check progress,

Definition: Inclusive teaching is any instructional method or approach that involves students and teachers in a partnership to specifically meet both individual and group needs during classroom instruction.

diverse classes, I realized that I needed to rethink my approach to support. I realized that I needed to: 1) ensure teachers that their concerns about time and the curriculum would be taken into consideration; 2) involve them in the process of exploring the needs of students and the possible roles that they could play in meeting student needs; 3) help them identify and use personally relevant instructional devices and routines in their lessons in order to enhance their delivery of content information and meet student's needs.

What would this new approach to support be?

First, I decided to use the KU-CRL criteria for selecting interventions for heterogeneous groups of students in secondary content area classes. This criteria emerged as part of the “ReflActive Planning” research being conducted by the Center. This research indicates that general secondary education content area teachers are more likely to make decisions related to **more inclusive teaching (see definition box)** when they ensure that: 1) both group and individual learning needs can be met within the context of group instruction; 2) the critical

discuss issues, and make plans.

5) Teachers actually assume the role of researcher and reflective practitioner in order to guide personal professional development.

Third, I realized that once I formed the group I needed to have some “content” that I could use as a basis for discussing ideas and approaches related to more inclusive teaching. I decided to use the ReflActive Planning Questions and the Analogical Anchoring Routine as a way of facilitating the group. However, I realized that I might have to “give up” these ideas if they did not match with the teacher's needs.

However, the fact that I wanted to learn and try these ideas about supporting more inclusive planning and teaching meant that I was an authentic member of the study group. I was working on my own professional development with the rest of the teachers. I **was** a co-learner. This perspective seemed to be consistent with the ideals of the Cooperative Study Group process.

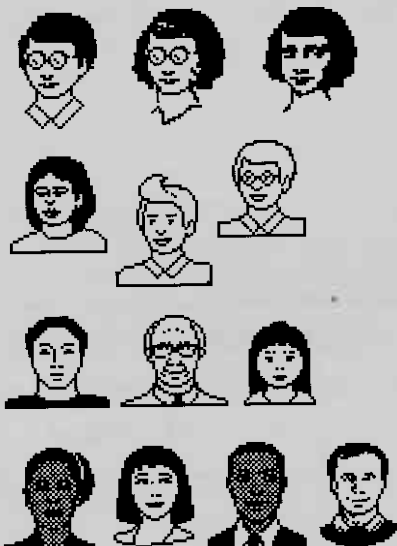
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Working Through the Process

I invited three teachers to work with me in this project. The teachers included Maribeth Westlund, Joann Hartmann, and Sue Rucks. We met four times between March and May. The first two sessions focused on how the teachers planned lessons for classes of diverse students. We examined beliefs about our roles in teaching content and learning strategies. Not surprisingly, the primary concern of these secondary teachers was the delivery of content information.

We talked about the ReflActive Planning Questions, how students have difficulty understanding new concepts and ideas, and how teachers had trouble explaining unfamiliar concepts and then



relating them to student's experiences. This was an excellent lead for discussing the use of the Analogical Anchoring Routine in their classes. We brainstormed ways of applying the ReflActive Planning Questions and the Analogical Anchoring Routine in their classes.

At the third group meeting, the teachers shared stories of implementation. Early efforts were awkward. I watched one of the teachers use the Analogical Anchoring Routine in a lesson on socialization. I became confused and I lost the benefit of using the analogy that was presented for anchoring the new concept of socialization. I realized that developing analogies that were clear and helpful was going to be hard work.

Continued practice brought insight and refinement. Using the Routine, Maribeth began to build classroom activities that more actively involved students and were centered around trying to bring out background experiences. For example, in one lesson she had students actually build a "human

pyramid" as the basis for presenting an analogy related to understanding Maslow's Hierarchy of Human Needs. When she felt that the students were really familiar and thinking about a previous or current experience, she would build the analogy.

"...the specific teaching routines such as the Analogical Anchoring Routine was more efficient when planning for larger chunks of content, such as unit, rather than planning day to day activities."

This took more time, but appeared to significantly improve comprehension of new concepts. See **Analogical Anchoring Table on page 7.**

In addition, the sharing of background experiences as a preparation step to learning appeared to promote group building and more interactions between students. During the "pyramid activity" in Maribeth's class, Carrie (a blind student who had only been mainstreamed second semester from a separate school) volunteered to be on the top of the pyramid. Previously she had risked little and not bonded with students in this class. During the discussion that followed the demonstration, an ESL student, Rahul, invited classmates to join the new multicultural club. Clearly, the exploration of familiar experiences as an anchor was a springboard for making connections among the diverse group of students in addition to being a springboard for teaching new concepts and ideas.

Our fourth meeting took place at the end of the year and we discussed what we learned. In general, the Cooperative Study Group process and their work in implementing the Analogical Anchoring Routine appeared to raise teachers' awareness of the instructional needs of diverse groups of students. As

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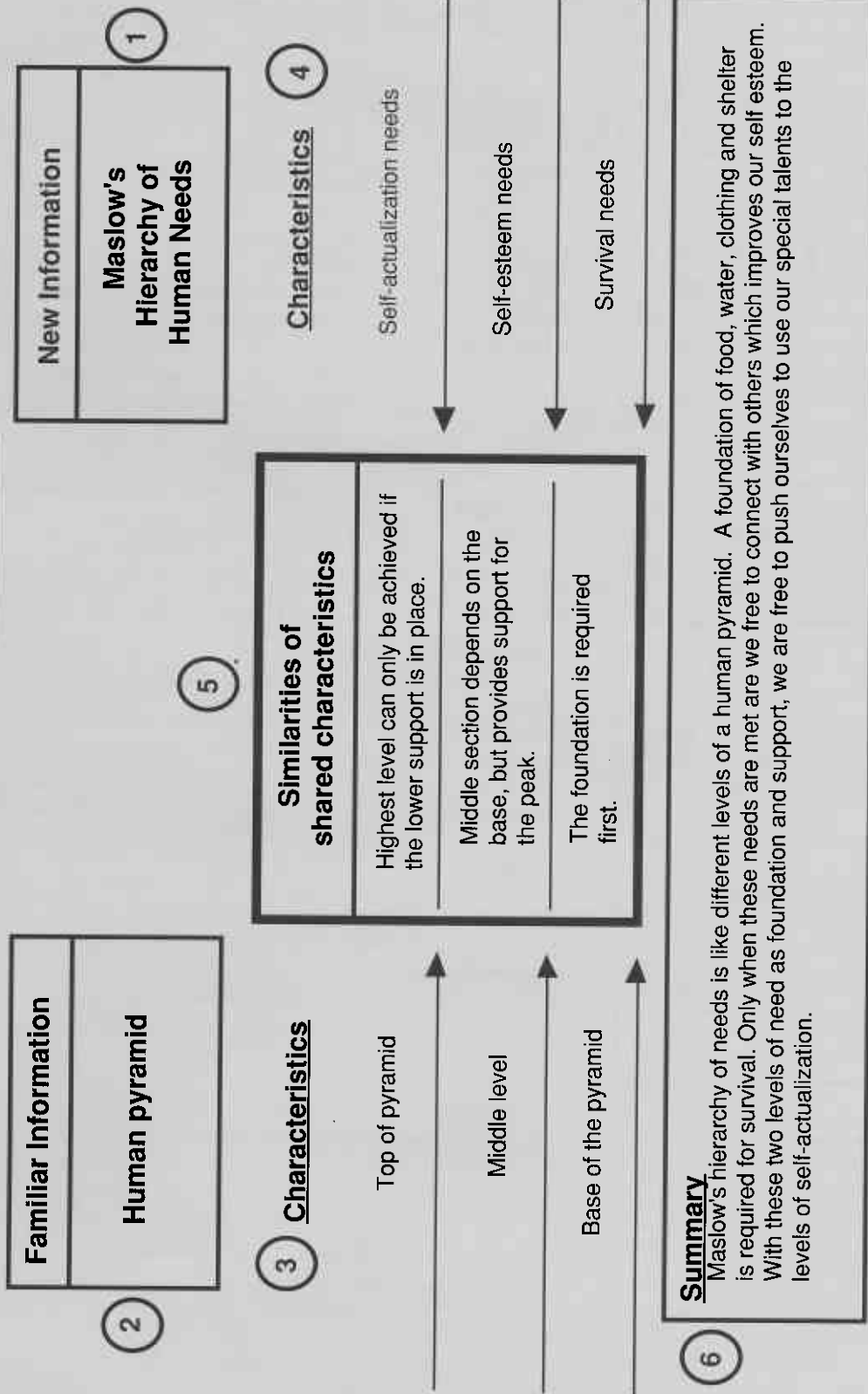
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ANCHORING TABLE



Created by Maribeth Westlund, Schaumburg High School, KU-CRL, 3-91. May be reproduced.

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a result of this process, the teachers concluded that incorporation of the ReflActive Planning Questions and the specific teaching routines such as the Analogical Anchoring Routine was more efficient when planning for larger chunks of content, such as a unit, rather than for planning day to day activities. As a result, these three teachers, along with seven new recruits and myself are looking forward to exploring how to approach strategic planning and teaching for a unit, using the new Unit Planning Routine and the Unit Organizer Teaching Routine. The Cooperative Study Group process seems to be working.

ReflActive Planning Questions

What content, relationships, and strategies really **critical outcomes** for students?

How might students think about the content and the relationships so that they could see and **organize** the parts for studying or explaining the content to someone else.

What might make the content, relationships, and strategies **difficult** to learn? What about

quantity, interest, relevance, complexity, background knowledge, organization, and abstractness

How can I **enhance** enhance or transform the critical information so that it is less difficult for students to learn? What teaching devices, routines, and strategies would be important to use to enhance learning?

How can I **directly and explicitly teach** and focus students' attention on the critical information and the devices, routines, and strategies that are important?

How can I **evaluate** if students are learning the critical content as I teach and if the devices, routines, and strategies are helping students? If students are not learning the critical content, do I need to **reevaluate** what or how I am teaching?

Note: B. Keith Lenz KU-CRL contributed to this article.



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