Identifying Similarities and Differences

The ability to break a concept into its similar and dissimilar characteristics allows students to understand (and often solve) complex problems by analyzing them in a more simple way. Teachers can either directly present similarities and differences, accompanied by deep discussion and inquiry, or simply ask students to identify similarities and differences on their own.

Applications:

* Use Venn diagrams or charts to compare and classify items.
* Engage students in comparing, classifying, and creating metaphors and analogies.

Summarizing and Note Taking

These skills promote greater comprehension by asking students to analyze a subject to expose what's essential and then put it in their own words. According to research, this requires substituting, deleting, and keeping some things and having an awareness of the basic structure of the information presented.

Applications:

* Provide a set of rules for creating a summary.
* When summarizing, ask students to question what is unclear, clarify those questions, and then predict what will happen next in the text.

Reinforcing Effort and Providing Recognition

Effort and recognition speak to the attitudes and beliefs of students, and teachers must show the connection between effort and achievement. Research shows that although not all students realize the importance of effort, they can learn to change their beliefs to emphasize effort.

Applications:

* Share stories about people who succeeded by not giving up.
* Have students keep a log of their weekly efforts and achievements, reflect on it periodically, and even mathematically analyze the data.

Homework and Practice

Homework provides students with the opportunity to extend their learning outside the classroom. However, research shows that the amount of homework assigned should vary by grade level and that parent involvement should be minimal. Teachers should explain the purpose of homework to both the student and the parent or guardian, and teachers should try to give feedback on all homework assigned.

Applications:

* Establish a homework policy with advice-such as keeping a consistent schedule, setting, and time limit-that parents and students may not have considered.
* Tell students if homework is for practice or preparation for upcoming units.
* Maximize the effectiveness of feedback by varying the way it is delivered.

Nonlinguistic Representations

According to research, knowledge is stored in two forms: linguistic and visual. The more students use both forms in the classroom, the more opportunity they have to achieve. Recently, use of nonlinguistic representation has proven to not only stimulate but also increase brain activity.

Applications:

* Incorporate words and images using symbols to represent relationships.
* Use physical models and physical movement to represent information.

Cooperative Learning

Research shows that organizing students into cooperative groups yields a positive effect on overall learning. When applying cooperative learning strategies, keep groups small and don't overuse this strategy-be systematic and consistent in your approach.

Applications:

* When grouping students, consider a variety of criteria, such as common experiences or interests.
* Vary group sizes and objectives.
* Design group work around the core components of cooperative learning-positive interdependence, group processing, appropriate use of social skills, face-to-face interaction, and individual and group accountability.

Setting Objectives and Providing Feedback

Setting objectives can provide students with a direction for their learning. Goals should not be too specific; they should be easily adaptable to students' own objectives.

Applications:

* Set a core goal for a unit, and then encourage students to personalize that goal by identifying areas of interest to them. Questions like "I want to know" and "I want to know more about . . ." get students thinking about their interests and actively involved in the goal-setting process.
* Use contracts to outline the specific goals that students must attain and the grade they will receive if they meet those goals.

Generating and Testing Hypotheses

Research shows that a deductive approach (using a general rule to make a prediction) to this strategy works best. Whether a hypothesis is induced or deduced, students should clearly explain their hypotheses and conclusions.

Applications:

* Ask students to predict what would happen if an aspect of a familiar system, such as the government or transportation, were changed.
* Ask students to build something using limited resources. This task generates questions and hypotheses about what may or may not work.

Cues, Questions, and Advance Organizers

Cues, questions, and advance organizers help students use what they already know about a topic to enhance further learning. Research shows that these tools should be highly analytical, should focus on what is important, and are most effective when presented before a learning experience.

Applications:

* As you begin a unit or lesson, use cues (i.e. hints of what students are about to learn) to help students retrieve, use, and organize what they already know about a topic.
* Pause briefly after asking a question. Doing so will increase the depth of your students' answers.
* Vary the style of advance organizer used: Tell a story, skim a text, or create a graphic image. There are many ways to expose students to information before they "learn" it.