STRATEGY TITLE: Direct Analogies (Synetics)

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Curriculum Area(s):
Science

Grade Level:
3rd Grade

Time Required : 50 minutes

Instructional Grouping: Homogeneous - GT Pull Out

Explanation of Strategy:
Synectics was developed in 1961 by William J. Gordon and is a system of problem solving that makes conscious some of the subconscious processes involved in creativity. It is a style of thinking in which students deliberately manipulate a metaphor or analogy for the sake of insight. New connections are made between the familiar and the strange as students learn either to see what they already know in a brand new way or to see a brand new thing in terms of what they already know. This helps students to gain new insight and a new point of view. It helps students to make strange new connections to stretch their thinking. Synectics not only teaches students to think not only about the subject matter, but also promotes in-depth understanding of content. Synectics is a versatile technique as it can be used with all grade levels to develop both individual and group creativity and to serve as an interdisciplinary model for creative problem solving.

One strategy used in the synectics process, direct analogies, is described below.

Overview:
The teacher should help students place the subject in a context that will lead to innovative viewpoints. The emphasis is on the students? rationale for their analogies.
Phase 1- Students are presented with one subject and the rationale for a comparison. They must think of another subject to fit the rationale.
Phase 2- Students are presented with an analogy between two subjects. They must explore the analogy for a rationale.
Phase 3- Questioning begins with the comparison of an adjective with opposite subjects, with concrete subjects of the same category, with two

abstract subjects, and with a concrete subject and an abstract subject. Students must give a rationale for their choices.
Phase 4- Students are given a category to limit their search for an analogy with a given subject. They must give a rationale for their analogy.
Phase 5- Students are given one subject. They must think of another subject with which to compare it and must give a rationale for their analogy.
Using Direct Analogy in a Synectics Excursion - While no example is given in this paper, the steps are included because they describe the next step students should follow in learning through Synectics. The direct analogy exercise should be used as soon as the teacher feels the students have grasped the direct analogy method of generating ideas.
1. The teacher presents the problem.
2. The introduction of background information- either by a professional or other source.
3. Purge- Students voice what seem to be obvious solutions to the problem. The expert guest or the teacher points out flaws in their statements.
4. Generation of Problems as Understood. Students write the problem as they understand it.
5. Choice of Problem as Understood- Problems are read aloud and students are directed to work around the problem.
6. Evocative Questions- Phase 1 - 5; Students work toward a solution using direct analogy.
7. The teacher leads the group in a discussion about the analogies they have drawn.
8. Force Fit- The analogy is fit to the problem in order to reach a solution
9. Viewpoint- The group evaluates its success in solving the problem.

Materials:

Pencils, crayons, or markers, paper, chart paper (Students)
Markers, chalk, overhead pens, or dry erase markers. Chart paper, chalkboard, white board, overhead, or tape recorder (teacher)(jbbtest """)

Examples of Use:

This example of synectics will make the strange familiar using direct analogy. The teacher will ask students to compare two objects or ideas in order for students to grasp the overall concept, ?system?. Using synectics will help students to understand how a system works and that the parts are interdependent. The system they are studying in general is habitats - specifically, in this lesson, how a desert plant is a system adapted for survival in the desert.
Phase 1- Students are presented with one subject and the rationale for a comparison. They must think of another subject to fit the rationale. The teacher should provide a cactus and several hand held magnifying glasses

for each small group to study as well as reference books on the subject. When all groups have completed the analogies, the teacher leads a class discussion of their responses.

1. The skin of a cactus is like _____ because it helps to hold moisture inside.
2. The pores of a cactus are like _____ because they are so small.
3. The roots of a cactus are like _____ because they soak up water so quickly.
4. The flowers of a cactus are like _____ because they are so rare.

Phase 2- Students are presented with an analogy between two subjects. They must explore the analogy for a rationale. Students are directed to draw each of the four examples and to label the parts of each before they write their reasoning. Drawings and reasoning is shared with the class.

1. A cactus is like a system because?.
2. A pen is like a system because?.
3. An aquarium is like a system because?.
4. A team is like a system because?.

Phase 3- Questioning begins with the comparison of an adjective with opposite subjects, with concrete subjects of the same category, with two abstract subjects, and with a concrete subject and an abstract subject. Students work independently on this phase and must give a rationale for their choices. Reference books and dictionaries on various reading levels are provided for students to use if necessary. A class discussion follows.

1. Which is quieter in a desert- day or night? Why?
2. Which is smarter - rattlesnake or kangaroo rat? Why?
3. Which is necessary in a desert - will power or cunning? Why?
4. Which is more important in a desert - adaptation or water? Why?

Phase 4- Students are given a category to limit their search for an analogy with a given subject. They must give a rationale for their analogy. Students work independently. Reference books are provided for student use. The class meets to discuss their answers and their reasoning.

1. What arachnid is like a mole? Why?
2. What bird is like a racecar? Why?
3. A rainstorm is like the spring. Why?
4. The night is like a refrigerator. Why?

Phase 5- Students are given one subject. They must think of another subject with which to compare it and must give a rationale for their analogy. No reference books are used for this phase of the lesson. Students are directed to think of any analogy they can give so long as their rationale is plausible.

1. The sand is like a _____ because?
2. The scorpion is like a _____ because?.
3. A cactus is like a _____ because?.
4. Relief is like _____ because?.

Practical Hints for Implementation:

1. Avoid focusing on a one-to-one relationship between two subjects. While the teacher may have a specific answer in mind, the teacher should encourage multiple viewpoints and emphasize students? rationale.

2. Teachers need to maintain on open, non-threatening environment where students feel free to share their ideas with others.

3. The exercises should be worked through orally, so that students will have a clear understanding of the logic involved in making analogies.

4. Keep reference books on several reading levels handy for children to research their ideas when specific subject matter is requested.

5.Be flexible with time management. The phases may be divided into individual lessons.

6. While synectics is an excellent strategy for developing creativity and problem solving, teachers should infuse the lessons into the content rather than practice it in isolation.

Related Web Sites:

http://www.ozemail.com.au/~caveman/Creative
http://enchantedmind.com/
http://www.creativesparks.org/

Supplemental Resources:

Springfield, L. H. (1986). ?Synectics, Teaching Creative Problem Solving by Making the Familiar Strange. ? GCT-July/August, pp. 15-19.

McAuliff, J. H. and Stoskin, L. (1987). Synectics, The Creative Connection. GCT July/August, pp. 18-20.

Jimenez, J. (1975). ? Synectics: A Technique for Creative Learning?. The Science Teacher. March, pp. 33-36.