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Belton School District #124
ENCOURAGING • CHALLENGING • ACHIEVING

# Strat-O-Grams

*A newsletter of research-based strategies for Belton School District students, teachers and parents*

## Using Memory-Enhancing Strategies to Learn Multiplication Facts

The following is a specific strategy taught for remembering the multiplication facts. In this strategy, all 100 basic multiplication facts that involve the number 0-9 are first grouped into families. Those families are: the zeros, one, twos, fives, nines, and pegwords. A fact will be included in a family if it contains at least one number that corresponds to the name of that family. For example, the fact, 0 x 4, belongs in the zeros family because it contains at least one 0; the fact, 2 x 7, belongs in the "doubles" family because it contains at least one 2; the fact, 1 x 5, can be included in either the ones or fives family. There are 15 facts that make up the "pegword" family.

The facts involving 0 and 1 are the easiest to learn, so these strategies should be taught first. The facts involving 2, 5, and 9 are more difficult to learn, so these strategies should be introduced after the students have mastered the zeros and ones families. The last 15 facts, which are called pegwords, should be taught last because this strategy takes more time to learn.

Begin with the "0" strategy using the corresponding chart. Continue practicing this strategy for several lessons until the students can accurately answer the related multiplication facts. Once the "0" strategy is mastered, practice the "1" strategy using the corresponding chart until the students can accurately answer the related multiplication facts.

Before introducing the "2" strategy, the students need to be taught to associate a visual image with each fact in the family. The *Numbers with Associated Pegwords and Symbols* chart will help them learn the associations. The chart is easy for students to remember: 2 x 2 – a skateboard with two sets of wheels; 3 x 2 – a six pack of pop; 4 x 2 – a spider with two sets of four legs; 5 x 2 – two hands with all fingers held up; 6 x 2 – a dozen eggs in a carton; 7 x 2 – a calendar with 2 weeks circled (7 days and 7 days); 8 x 2 – two octopi, each with eight tentacles; 9 x 2- an "18 wheeler" truck (9 wheels on each side). Make sure students are successful with the 0, 1, and 2 strategies before introducing the "5" strategy.

Students will also need to be fluent in counting by 5s before introducing them to the "5" strategy. Practice counting by 5s for several days for short periods of time, and let the students know that this practice will help them learn some of the multiplication facts.

Teaching students the "9" strategy involves using the *Linking for 9* strategy chart and the *9 Strategy* chart. The *Linking for 9* chart teaches the students to associate pairs of numbers. For example, the number 1 is linked to the number 8; the number 2 is linked to the number 7; and the number 3 is linked to the number 6.

The "pegword" strategy is more difficult and generally will take longer for the students to learn. The students must begin by associating each number word used in this family with a rhyming pegwords from the *Numbers with Associated Pegwords and Symbols* chart.

Prepare flashcards with the number word on one side and the pegwords and symbo9l on the other. For example: the number word "one" on one side and the pegword "sun" on the other with a picture of a sun.

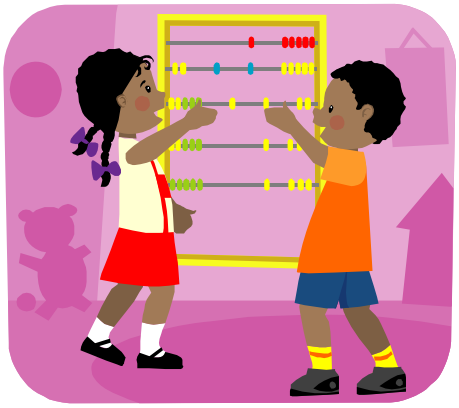
Introduce three associations at a time. Once those are mastered, add three more at a time and review the previously learned associations until the first nine associations are mastered.

Practice alternating the use of each side of a flashcard and requiring a correct response. For example, when you hold up the number words "two" the student would respond "shoe." When the pegword and symbol for "door" is held up, the student response would be "four."

Once these nine pegwords are mastered, prepare flashcards that have the combinations of pegwords on them. For example, the number 21 is illustrated by combining "twin-T" with "sun,' which is the 3 x 7 fact; and the number 32 is "dirty" and "shoe" combined which is the 4 x 8 fact. These flashcards are then added to the practice sessions.

Once the students have mastered the pegword flashcards, the pegword strategy can be taught.

Once the students are ready for the pegword strategy, flashcards should be made using the information on the *Pegword Family of Facts, Associations, and Elaborations* chart. The facts, the corresponding pegword and the visual associations should all appear I one side of the flashcards.



Introduce the pegword strategy using the *Pegword Strategy* chart. Begin by showing the first three pegword fact flashcards. As each flashcard is shown, lead the students through the corresponding elaboration provided on the *Pegword Strategy* chart. Students should repeat the elaborations because this will help them remember the facts.

## How it Works

**Preskills**

Students must be able to correctly name and write the numerals from 0 – 9 and count by 5s.

**Steps**

If one or more strategies have already been taught, review them at the beginning of the lesson.

Give each student a worksheet on which has been written a few multiplication facts from each of the families.

Demonstrate how to find the problems in the family being taught by running your finger under the problems. Stop at each and think out loud. "Is there a _____ (e.g. 0) in this problem?" Then answer your own question.

Hold up the strategy chart. Read it to the students. Go through the examples on the chart. Have the students practice saying the rules.

Draw the students' attention to the first problem on their worksheet. Ask the question "Is there a _____ (e.g. 0) in this problem?" If the answer is yes, lead the students in saying the rule, then direct them to write the answer under the first problem. If the answer is there is no _____(e.g.0) present, tell the students to skip the problem and go on to the next one.

Continue this procedure until all problems in the family have been identified and answered.

Go back and answer and follow the same directions for the next family until all the problems have been answered.

## Depth of Knowledge Linkage

This particular strategy can be linked with the Depth of Knowledge Chart (DOK) at various steps of the strategy.

DOK 1: Activities where the students need to identify certain numbers in each problem in order to identify which strategy they could use to solve the problem.

DOK 2: Activities where the students sort the problems to be solved by the strategies needed to solve the problems.

DOK 3: Activities where the students can recognize and can explain the strategies they select to solve the problems.

DOK 4: Activities where the students apply the strategies they learned to solve the problems.

References

Wood, Donna K., & Frank, Alan R. (2000, May and June). Using Memory-Enhancing Strategies to Learn Multiplication Facts. *Teaching Exceptional Children, 32 (5), 78-82.*