Drill, Review, and Practice in a Problem Solving Setting

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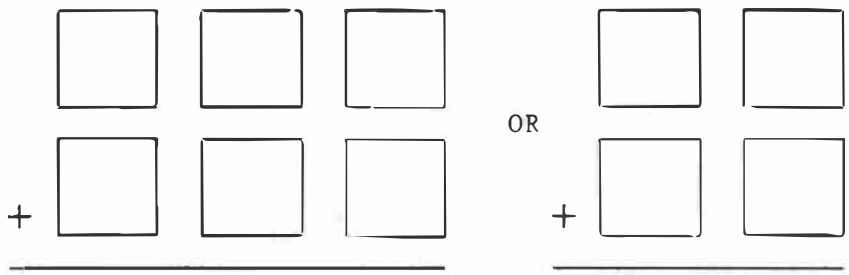
One activity that I have used in my mathematics class is "Digit Draw." This can be found on pages 57 through 60 in the Grade 7 book of the Lane County problem solving material, published by Dale Seymour.

I especially like this activity because it can be adapted to suit the various skill levels of students. It is an excellent way to give students drill and practice in whole numbers, decimals, and place value. The activity can be used at any time, but is useful at the beginning of the school year for review and/or drill and practice.

Division II students can play the game in the following manner to reinforce place value and addition skills.

Basic Activity

Students copy the following arrangement of boxes:



If three digits are too many, make it two two-digit numbers. Explain that you will draw out six cards (from a set of 10 cards numbered zero to nine), one at a time. The students place the digit in one of the boxes. The digit cannot be moved once it is placed in a box. Be sure all students have written the digit in before drawing the next card. The object is for students to make the largest possible sum that they can.

After the six cards are drawn, have students find their sum, and then see who has the largest. The basic activity may be modified. Note that all four basic processes could be used. Further draws may be made without replacing the digit or after the digit is replaced. The following examples show several ways in which this basic activity can be modified.

Application 1

After everyone has found their sum, ask students how they could use the six digits drawn in an arrangement that produces the largest sum possible.

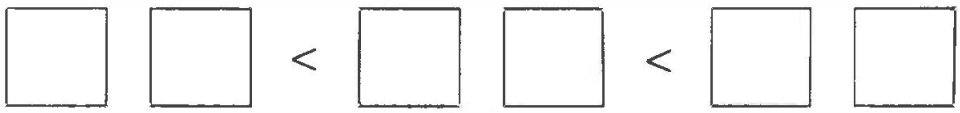
You can also direct the class to find the smallest sum, or the sum closest to a chosen number (for example, 600).

This activity can be adapted for multiplication, subtraction, division, and place value.

Application 2

An example of how to give students drill and practice in sequencing and place value follows.

Provide the following arrangement of six boxes, or have students draw their own:

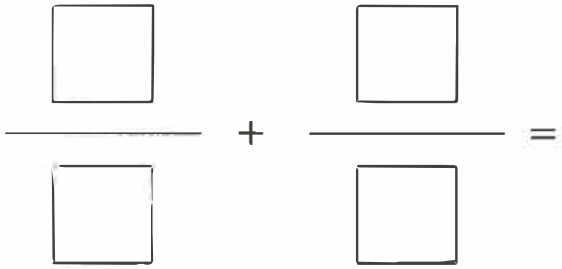


Draw six cards, one at a time, and have the students record the numeral in the boxes so that a true mathematical statement is made.

You may wish to modify this activity to four boxes for two two-digit numbers.

Application 3

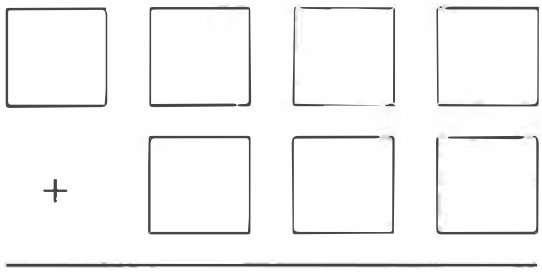
A fraction drill and practice can be done easily by using the following arrangement:



Have the students find the largest fractional answer or the answer closest to a number you have chosen. The sign can also be changed to give practice in any of the other operations.

The activity may be applied or varied by excluding or replacing the card after each draw. Some teachers have replaced the 10 cards with a 10-sided die or tumbler, marked from zero to nine. Using this tumbler allows students to work with a partner and play some of the drill and practice games that follow. The activities may be undertaken with a draw of a digit.

Have students place the following arrangement of seven boxes on their page:



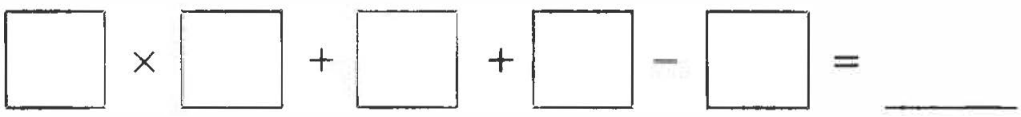
Divide the class into pairs of students, and give each pair a tumbler. The object of the game is to make the largest sum, with the following conditions:

Each student takes a turn rolling the tumbler. The student who rolls the tumbler has the option of using the digit for his/her own sum or giving it to his/her partner.

For example, if Student A rolls a two on the first roll, she would realize that this wouldn't give her the largest sum, so she writes it in the thousands box on Student B's page. Then Student B rolls and must decide if the number he rolls will help him or hinder Student A. When all students have filled up their seven boxes, each student adds up his/her numbers, and the winner is determined.

Application 4

The following exercise using the tumbler involves several operations. Have students set up the following mathematical sentence:

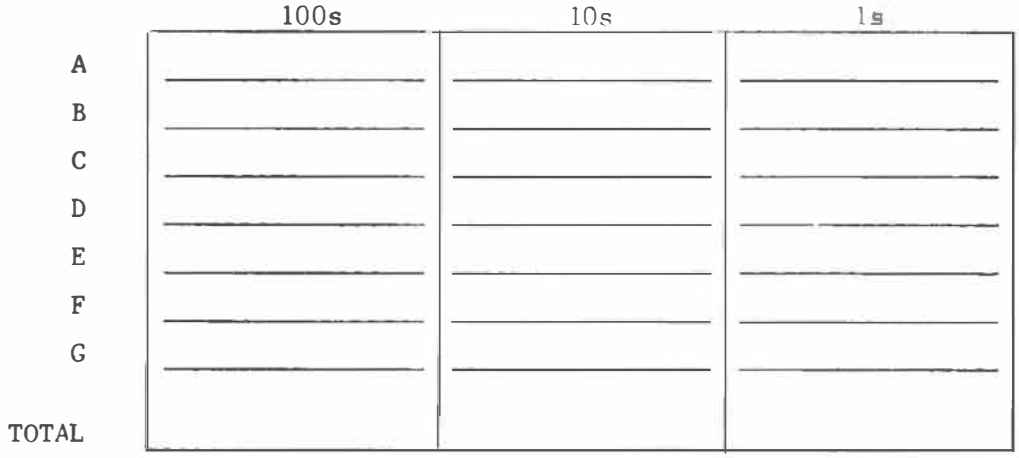


Tell students that you will roll the tumbler or draw a digit and that they are to place it in any of the boxes. The objective is to make the largest (or smallest) answer.

Application 5

Still another game can be played to give students further practice in place value and addition.

Have students copy the following table:

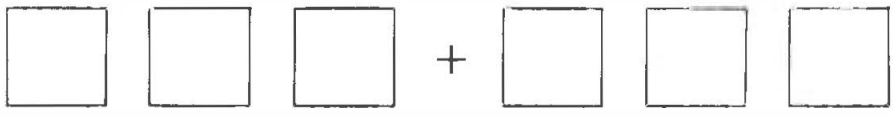


The objective is to be the closest to 500, or between 275 and 300, or some similar total. The teacher rolls the tumbler. Students must decide whether to place it in the hundreds, tens, or ones column. Suppose a two is rolled. It can be 200, 20, or two. On the next roll, a five comes up. It can be a 500, 50, or five. After seven rolls, the students total up their charts to see if they have met the objective.

Summary

Digit Draw, in all of its various forms, using cards or a tumbler, also fosters problem-solving strategies such as eliminating possibilities and breaking the problem into manageable parts. One method used to help students develop problem-solving skills, while doing this activity, is to have them explain to the class how they found their answer.

For example, in



the student might say that when the number eight or nine was drawn, she knew that it wasn't any help to place it in the hundreds position, but it might he useful in the tens or ones place.

In this way, the class is exposed to a variety of strategies, and students can then choose their favorite method to try next time.

The adaptability of this activity for different grade levels, problem solving strategies, and review of various concepts makes Digit Draw an excellent activity.

Mary Jo Maas was a teacher at G.R. Davidson School in Fort Macleod, and currently holds the position of secretary for MCATA. During 1985-86, Mary Jo has been seconded to the Faculty of Education, University of Lethbridge, to teach curriculum and instruction courses in mathematics and supervise student teachers.

REFERENCE

Schaaf, Oscar. Problem Solving in Mathematics for Grade 7. Eugene, Oregon: Lane Education Service District, 1981.

Seven-Link Chain Problem

(continued from page 14)

Once you have solved the basic problem on page 4 and the two variations on page 14, arrange the data into an organized list. Analyze the data to determine relationships. Some sample questions could include:

- How does the shortest link that is more than one unit long compare to the number of individual links?
- How do the links that measure more than one link increase?
- Can a formula be derived for the length of the longest link?

A partial chart is provided below, and the basic problem is solved:

		Lengths of Multiple-Link Segments				
Chain Length	Unit Tally	First	Second	Third	-----	n.
7 links	1	2	4			
?	1.1	?	?	?		
63 links	1.1.1	?	?	?	?	