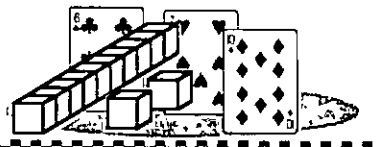
Objective:

Use manipulatives, diagrams and symbols to demonstrate and describe the processes of addition and subtraction to 100.



Representation:

Materials: deck of cards (blacks: 2, 3 and 4s only, reds: 2 to 9 only), bingo chips, 100 board, paper, pencil, base ten blocks.

• Separate the red and black cards. Draw one black card and one red card to make a two-digit number (black is the digit in the 10s place). Repeat to construct a second number. The task is to find the sum of these two numbers. Assume we have drawn the values 35 and 42.

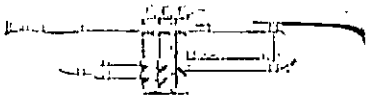
• Place a bingo chip on the zero of the 100 board. Move the chip forward the same number of spaces as the value of the red card in the first number (5 in our example). Now move the chip forward the same number of spaces as the value of the second red card (2 in our example). Add the value of the two red cards. What do you notice?

• Move your chip downward the same number of rows as the value of the first black card (3 in our example). Repeat for the second black card (4 in our example). The space where the chip lands represents the sum of the two numbers (77 in our example).

NOTE: To model addition, we move the marker right (+1) and down (+10) starting at zero. To model subtraction, we move the marker left (-1) and upwards (-10) starting at the minuend. It is recommended that students model their equations with base ten blocks at the same time they write the traditional notations and work the 100 board.

PROBLEM SOLVING

Eighteen people came to listen to the concert on Monday and 39 came on Tuesday. How many in all came to the concert on these two days? How many came Wednesday if the total for the three days was 96?



STRATEGY: *Draw a Picture*

ANSWER:

The Monday and Tuesday total was 57. On Wednesday 39 people came to the concert.

adaptations:

DOWN

Talk about what a move on the 100 board represents:

• to move right one space means to add 1.

• to move left one space means to subtract 1.

• to move down one row means to add 10.

• to move up one row means to subtract 10.

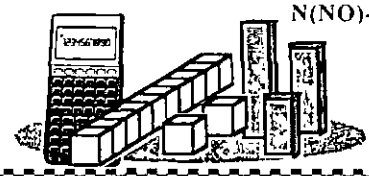
UP

A. Use base ten blocks to model 3 digit addends with sums to 1000.

B. Use the 100 board to model the addition of 3 or more smaller addends.

Writing Corner:

Explain what it means to "regroup" when adding or subtracting.



Objective: Apply and explain multiple strategies to determine sums and differences on 2-digit numbers, with and without regrouping.

Representation:

Materials: paper, pencil, counting rods, calculator, base ten blocks, metre stick, 6-sided die.

- Work with a partner. Each person rolls the die and takes the same number of rods (any color or combination of colors) as the value rolled.
- In turn, each person creates a train of his or her rods along the edge of the metre stick to determine the length.
- The task is to determine what the overall length of the two trains would be if placed end to end along the edge of the metre stick.
- One partner calculates the length by modeling the addition using base ten blocks. The other partner adds the two lengths with paper and pencil and then on the calculator.
- Working together, the partners now place their trains end to end to check the total length against the values determined using the paper/pencil, calculator and base ten blocks. Repeat, but switch roles.

PROBLEM SOLVING

Clarissa's shoe is 19 cm long. Joel's shoe is 24 cm long. How far would their two shoes stretch if placed end to end?

If you wanted to make the longest train possible using two different shoes of students in your class, whose shoes would you choose?

STRATEGY: *Write an Equation*

ANSWER:

Clarissa's and Joel's shoes together are 43 cm long.

adaptations:

DOWN

Use only 2 color rods at a time.

Construct a list of all the colors of blocks that give a length of 10, of 11, of 12, of 13, and so on.

UP

Allow students to take as many color rods as they wish to create trains greater than 100 cm in length.

Writing Corner:

Write a letter to a creature from another planet explaining how we would use base ten blocks to show 15 + 17. Draw a picture of you and your space friend.

Objective: Apply a variety of estimation and mental mathematics strategies to addition and subtraction problems.

Representation:

Materials: popsicle sticks.

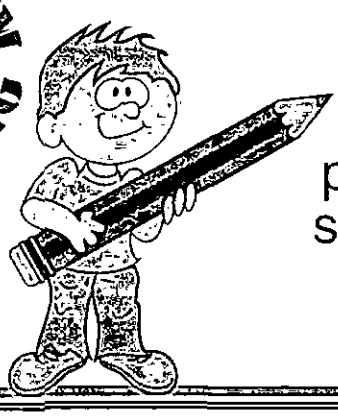
Strategy One: Count on Tens, then Ones

• Pick two numbers less than 50 (assume 38 and 25). Create two sets using popsicle sticks. To the largest number (38 in our example), add the tens of the second number and model by joining the tens bundles of the second number to that of the first number (in our example we would join to the 38 the two tens from the set of 25 thus creating 38 + 10 + 10 = 58). Now count on the remaining ones (in our example we have the 5 remaining singles from the 25, thus starting at 58 we would count 59, 60, 61, 62 63 ... for a sum of 63).

Strategy Two: Borrow

• Pick two numbers less than 50 (assume 38 and 25 again). Create two sets using popsicle sticks. Take the right number of singles from the second set and add them to the first set to complete a group of 10 (in our example we would take 2 singles from the 25 and add them to the 38 to create two new sets — the first set now has 40 and the second set has 23). Count all of the groups of ten and all of the singles to find the sum. Work with a partner to make up a problem and then find the sum mentally and with the popsicle sticks.

PROBLEM SOLVING



You and your partner want to cut a piece of string just long enough to circle both your head and your partner's head. How long should the string be?

STRATEGY: *Act it Out*

ANSWER:

Answers vary.

adaptations:

DOWN

Model the first strategy using the 100 board. Move a marker down a row for each ten, and to the right one space for each single in both numbers. Predict where the marker will end before moving it.

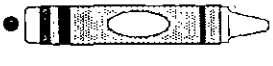
UP

A. Increase the values to be added, allow numbers < 100.

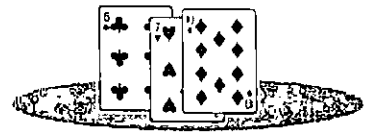
B. Model the second strategy using the 100 board: place one marker on each value. Have the markers compensate for each other (if one marker moves down a row, the other marker moves up, etc.). Continue moving the markers until one marker reaches zero.

Writing Corner:

Describe one way to add 14 and 28 in your head. Now try to describe another way.



Objective: Recall addition and subtraction facts to 10.

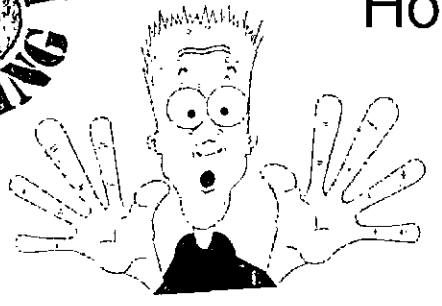


Activity:

Materials: deck of cards (A counts as 1, Q as zero, J and K removed).

- Play this game with a partner.
- Shuffle the cards and spread them out face down.
- Player one turns over a single card. Player two now turns over any 2 other cards hoping to find two cards with a sum or difference equal to the card turned over by player one.
- If unsuccessful, all cards are turned face down again and players switch roles. If successful, player two scores a single point and the cards are removed from the game. Players now switch roles.
- First player to score 3 points is the winner.

PROBLEM SOLVING



How many addition equations are there which have a sum of 10?

STRATEGY: *Construct a List*

ANSWER:

There are six in all.

adaptations:

DOWN

Restrict the set of cards to include only those with a value up to 5.

After finding the sum, the value must be checked with base ten blocks or with a calculator.

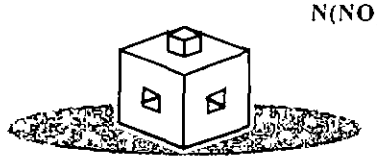
UP

If players are successful turning over the cards, ask them to provide one other addition or subtraction sentence with the same sum or difference. This must be done before they can collect their cards.

Writing Corner:

Why do 5 + 4 and 6 + 3 have the same sum?

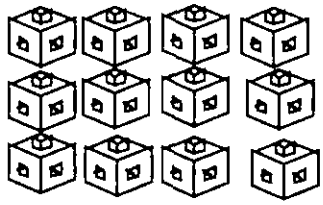
Objective: Demonstrate the processes of multiplication and division using manipulatives and diagrams.



Representation:

Materials: two six-sided dice (one red, one white), linking cubes, paper, pencil.

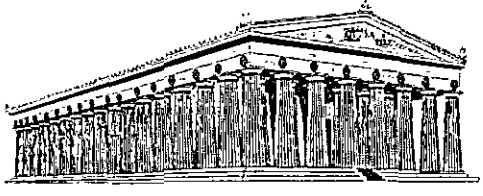
- Let the red die represent the number of sets of blocks, and the white die represent the number of blocks in each set.
- Roll the dice. Create an array of blocks: (Example: red rolled 3, white rolled 4)



- Draw a picture of your set. Write a multiplication statement to go with your picture.
- Create a bulletin board display of all the different arrays you can make using these two dice.

PROBLEM SOLVING

How many different ways can you find to arrange exactly 24 blocks into columns and equal sized rows?



STRATEGY: *Act it Out*

ANSWER:

There are 4 ways: 1 x 24, 2 x 12, 3 x 8, and 4 x 6.

adaptations:

DOWN

Replace the 6-sided dice with 4-sided dice to make smaller numbers of smaller sets.

Use a calculator to add up all of the blocks from each row.

UP

Replace the6-sided dice with 8 or 10-sided dice to maker larger numbers of larger sets.

Write addition sentences to go with each model. Write two division sentences to go with each model.

Writing Corner:

How can you tell if one number is divisible evenly by another? For example, can 14 be divided by 3 evenly? How do you know?