MathStars

★★★ 1. Toss a penny in the air 20 times and let it land flat.

Mark on the chart each head and tail.

Heads	Tails
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
Total:	

(1¢)

★★ 2. Six birds have built their nests. Four birds laid three eggs each and two birds laid four eggs each. How many eggs in all?

★★ 3. If a = 1¢, b = 2¢, c = 3¢, and so on, what is the value of your first name?

4. In your pocket you have two dimes, one nickel and two pennies. Your friend has one dime, three nickels and five pennies in his pocket.

My pocket: Friend's pocket:

_____¢   _____¢

Who has more money, you or your friend?

How much more?

Strategy of the Month

What if you know the result of a situation, but you don't know the beginning? For example, you might know that you end up with thirteen baseball cards after doing a certain number of trades and you want to figure out how many cards you had before the trading started. In that case you need to work backwards; you have to think about your actions in reverse order. This strategy works for any sequence of actions when you know the end result rather than the starting place. Try **working backwards** *to find the starting number on this flow chart:*
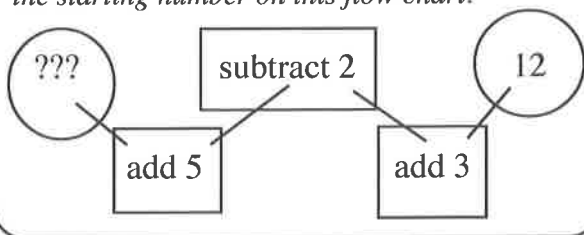
??? — add 5 — subtract 2 — add 3 — 12

★★ 5. What number am I?
   I am greater than nine.
   I am less than 7 + 6.
   I am an odd number.

★★★ 6. Put the numbers in the boxes where they belong.

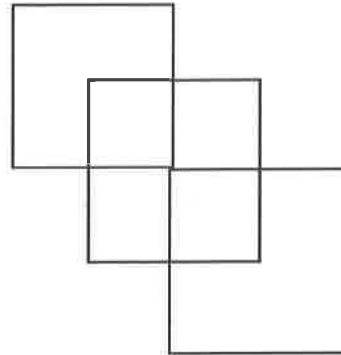[Hint: two numbers will not belong in any box.]

6, 28, 51, 33, 48, 59, 14, 66, 8, 73, 25, 82, 38, 17, 96

Greater than 52

Less than ten

Greater than 12 and less than 39

★ 7. How many squares are in this picture?

_____squares

★★★ 8. This puzzle piece was cut from a hundred board. Fill in the missing numbers.

25		
	36	
45		
	67	

About these newsletters...

 The purpose of the MathStars Newsletters is to challenge students beyond the classroom setting. Good problems can inspire curiosity about number relationships and geometric properties. It is hoped that in accepting the challenge of mathematical problem solving, students, their parents, and their teachers will be led to explore new mathematical horizons.

As with all good problems, the solutions and strategies suggested are merely a sample of what you and your students may discover. Enjoy!!

Discussion of problems.....

1. Students should realize that there is no right or wrong answer to this problem. The data collected could be shared for a large class graph. Discussion could focus on the "what ifs" of several situations, i.e., what if you had four heads in a row, what could come up next? What if you had all tails, what do you think could happen? What if you did this experiment five more times, what do you think would happen?

2. **(20 eggs)** Without modeling or drawing a picture the numbers in this problem would present quite a challenge for a first grade student. Students should be encouraged to talk through their solutions and share their strategies.

3. Again there is not a unique answer. Students could use coins or their calculators to help solve this problem. Extensions might include a search for the most (or least) expensive day of the week, month of the year, animal or car. Students can suggest other categories and explore the possibilities.

4. (My Pocket: **27¢**, Friend's Pocket **30¢; my friend has three cents more**) Another problem involving coins. Modelling with real or play money is an excellent way to help students arrive at solutions.

5. **(11)** The hundred board is an excellent help in solving this problem. Eliminating some numbers and highlighting others, students can solve number puzzles and later propose some of their own.

6. **(Less than ten: 6, 8; Greater than 12 and less than 39: 14, 17, 25, 28, 33, 38; Greater than 52: 59, 66, 73, 82, 96)** Students will practice making decisions about relative number values as well as using the vocabulary of comparison in solving this problem. It is also important that students justify their decisions as they place numbers in the boxes.

7. **(seven squares)** An organized method of counting should be encouraged. What is a square? How many large squares do you see? How many small squares? Colored markers or crayons may help some students. Tracing with fingers while counting is also to be encouraged.

8. **(See diagram below)** Familiarity with the hundred board will help students solve this problem. When I go up one square, by how much does the number change? If I move one square to the left, how does the value change? These kinds of explorations will help students make good use of the hundred board.