Multiplication

Thinking Strategies for Learning the Multiplication Facts

1. **Commutativity:** As with learning the addition facts, order can be changed when learning the multiplication facts. Hence, rather than learning 100 facts, we really only have to learn 55 facts.

2. **Multiplication by zero:** Students can easily grasp that 0 times any number is zero.

3. **Multiplication by one:** Again, the generalization is easy for students to see that 1 times any number is the number.

4. **Multiplication by two:** Students should be taught that multiplying by two is the Doubling strategy used in addition. Using the first four strategies, we have learned 27 more facts; only 28 remain to be learned.

5. **Multiplication by five:** Students can often be taught the fives by referring to the minute hand on a clock.

6. **Squaring:** As with the addition facts, students seem to learn square numbers faster than other facts.

7. **Multiplication by ten:** This pattern is very easy for students to see.

8. **Multiplication by nine:** Patterns emerge when multiplying by 9. One pattern is the sum of the digits in the product is always equal to 9. The other pattern is the ten's digit is always one less than the factor multiplied by 9. $9 \times 6 = 54$. Notice $5 + 4 = 9$ and the 5 in the product is one less 6, the number being multiplied by 9. Another example, $8 \times 9 = 72$, the sum is 9 and the tens digit is one less than the tens digit. Only 10 facts to go.

9. **Distributive property:** Students should feel comfortable breaking numbers apart and using previously learned information. For instance, 7×6 might be rewritten as $7(5 + 1)$. This would allow a student to use the 7×5 fact that he knows and add that to the 7×1 fact to get 42.

10. **Finger math:** Facing your palms of your hands to your face, let the baby finger become the 6 finger, the ring finger the 7, the middle finger the 8, the index finger be the nine finger. To multiply the 7×7, place the two ring fingers together. The number of fingers touching and below represent the tens digit. There are four fingers, multiply the fingers above those on each hand to determine the ones digit. That would be 3×3. The product is 49. Try 7×9 by touching the index finger on one hand with the index finger on the other hand. There are 6 fingers touching or below so the