Math Message

What Should I Know About Multiplication and Division Facts?

A goal of the elementary math curriculum is that students master basic multiplication and division facts. Demonstrating mastery of basic facts typically means that you can produce the answer in about 3 seconds or less without resorting to inefficient methods such as counting.

There are three important steps to mastering basic facts. Students need to :

- understand what addition and subtraction mean,
- develop efficient thinking strategies to find the answers,
- and practice using the strategies until the strategies become automatic.

Memorizing basic facts may appear to work for some children. However, students who memorize facts miss out on developing the number sense and reasoning inherent in a strategy approach. The strategies that are used to master the basic facts can be used as mental math strategies for bigger numbers.

Multiplication and Division Big Ideas

Multiplication and Addition are Related
Multiplication can be thought of as repeated addition. 6 x 3 is the same as 6 + 6 + 6.

Multiplication and Division are Related
Multiplication and division are inverse operations. If you know 5 x 4 = 20 you also know 20 ÷ 5 = 4.

Division and Subtraction are Related
Division can be thought of as repeated subtraction. 12 ÷ 4 is the same as subtracting groups of 4 until none are left.

Commutative Property
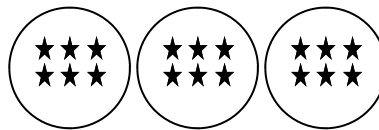The order of the factors does not change the product.

5 x 2

ROTATE

2 x 5
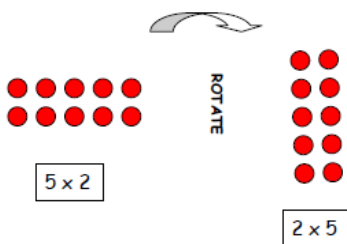
When you rotate the array, the number of dots doesn't change, just the way you describe it.

Multiplication Can Be Modeled Many Ways

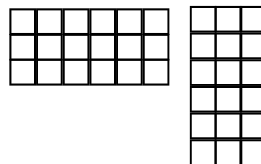#### Sets
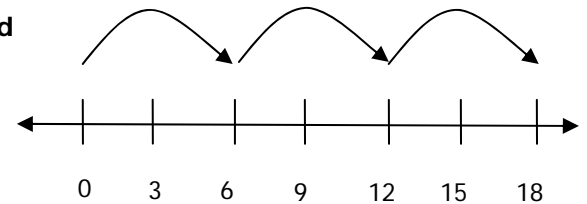3 x 6 can be thought of as 3 sets of 6 or 3 groups of 6.

Arrays
3 x 6 can be thought of as 3 rows of 6 or 6 rows of 3.

Number Lines
3 X 6 can be thought of as 3 jumps of 6 on a number line.
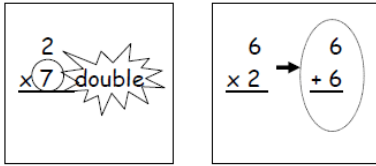
0   3   6   9   12   15   18

Numbers are Flexible
Numbers can be broken apart in many different ways. In 4 x 6, you can break the six apart several ways to think differently about the problem. You could think of 6 as 3 and 3, so you multiply 4 X 3 + 4 x 3. You could also think of 6 as 5 and 1, so you multiply 4 x 5 + 4 x 1.
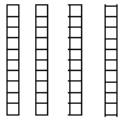
Basic Fact Strategies

Twos
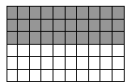Relate to addition doubles

Tens
Think: Groups of ten

Think: 4 x 10 is 4 groups of 10. 4 tens is 40.

Fives
Relate to Tens: think of a related tens fact and take half of it.

6 x 5

Think: 6 x 10 is 60, half of 60 is 30.
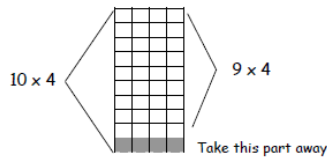
Zeros and One
Think about groups.

0 x 4 Think: 0 groups of 4 is 0.
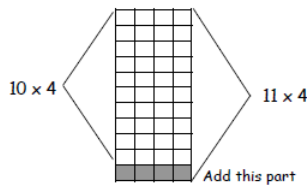
4 x 1 Think: 4 groups of 1 is 4.

Nines
Relate to Tens: think 10 x and subtract a group.

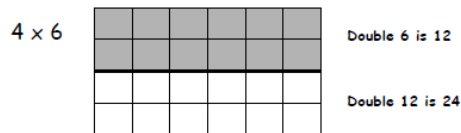9 X 4 Think: 10 x 4 is 40, but subtract one group of four, so...36.

10 x 4   9 x 4
Take this part away

Elevens
Relate to Tens: think 10 x 4 is 40, add another set of 4, so you get 44

10 x 4   11 x 4
Add this part

Helping Facts: Fours
Think: Double and double again

4 x 6   Double 6 is 12
Double 12 is 24

Helping Facts: Threes
Think: Double and one more set

3 x 6   Double 6 is 12
... and one more set of 6 is 18
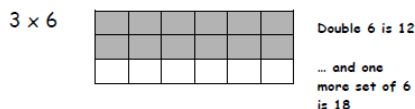
Helping Facts: Use a "Close" Fact
Think: Use a "close" fact and add one more set

6 x 7

6 x 6 = 36

... and one more set of six is 42
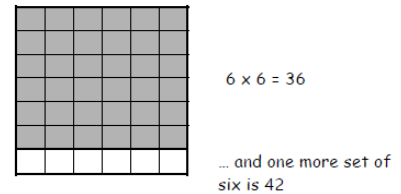
Twelves
Think: 10 x and doubles and add them together

10 x 4   12 x 4
Add this part
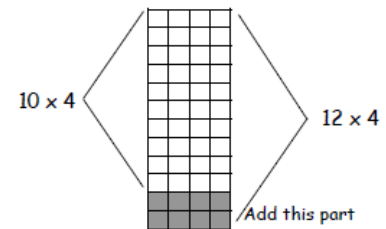
12 x 4 Think: 10 x 4 is 40, double 4 is 8, so 40 + 8 is 48.

Division as Think Multiplication
Think: Which multiplication fact could help me find an answer?

35 ÷ 7 Think: What times 7 is equal to 35.

What Can I Do to Help?

- Use the activity suggestions accompanying the strategies to reinforce each strategy.

- Provide frequent opportunities to practice basic facts. This can be done as you're driving in the car or waiting in line at the grocery store. Flash cards are not needed for practice.

- When your child is unable to provide an answer to a fact within three seconds, ask them to think of a strategy that might help.

- Even when your child can provide an answer quickly, occasionally ask him to explain a strategy that could be used to justify the answer.

- Provide encouragement. Fluency will happen gradually, not overnight.