WHAT IS THE #1 PROBLEM STUDENTS HAVE IN 5TH GRADE MATH?

Answer: They do not know their multiplication facts!!!

This causes even more problems when students are learning about division, decimals, fractions, etc. If they do not know their facts, it is really hard to learn everything else.

We are sending this packet home with students who have had trouble with multiplication facts during fourth grade.

Inside you will find:

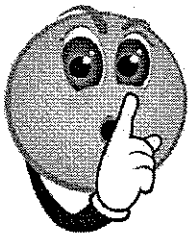
- Multiplication SECRETS for learning the facts. If you learn these, you will only have to memorize 11 facts!!!!
- Multiplication practice sheets - you can make copies so that you can use them more than once.
- Suggestions for how to work on facts at home.
- Instructions for multiplication games.
- Websites for additional practice.

We really appreciate your help. Your child will be more successful next year if you can spend a little time on this during the summer.

Thank you!!

JoAnn Ard and Melanie Collins, 5th Grade Math Teachers

MULTIPLICATION SECRETS!!!!



Can you count by 2's easily?
What about 5's and 10's? YES!!! It's so easy.
But what about counting by 4's and 7's? Not so easy.
Do you know why?

One reason is that we spend a lot of time counting by 2's and 5's and 10's when we are in 1st and 2nd grade. We practice them a lot.
It's reasonable to think that if you practice the other facts just as much, you will learn them just as well.

On the following pages you will find the secrets which help you solve most of the multiplication facts. You can see the examples on the chart below by finding the colored pattern. Some facts can be solved by using more than one secret, so just one pattern is shown on the chart.

THERE ARE ONLY 11 FACTS YOU WILL NEED TO MEMORIZE BECAUSE THEY DON'T FOLLOW A RULE OR HAVE A TRICK.

1x1=1	1x2=2	1x3=3	1x4=4	1x5=5	1x6=6	1x7=7	1x8=8	1x9=9	1x10=10	1x11=11	1x12=12
2x1=2	2x2=4	2x3=6	2x4=8	2x5=10	2x6=12	2x7=14	2x8=16	2x9=18	2x10=20	2x11=22	2x12=24
3x1=3	3x2=6	3x3=9	3x4=12	3x5=15	3x6=18	3x7=21	3x8=24	3x9=27	3x10=30	3x11=33	3x12=36
4x1=4	4x2=8	4x3=12	4x4=16	4x5=20	4x6=24	4x7=28	4x8=32	4x9=36	4x10=40	4x11=44	4x12=48
5x1=5	5x2=10	5x3=15	5x4=20	5x5=25	5x6=30	5x7=35	5x8=40	5x9=45	5x10=50	5x11=55	5x12=60
6x1=6	6x2=12	6x3=18	6x4=24	6x5=30	6x6=36	6x7=42	6x8=48	6x9=54	6x10=60	6x11=66	6x12=72
7x1=7	7x2=14	7x3=21	7x4=28	7x5=35	7x6=42	7x7=49	7x8=56	7x9=63	7x10=70	7x11=77	7x12=84
8x1=8	8x2=16	8x3=24	8x4=32	8x5=40	8x6=48	8x7=56	8x8=64	8x9=72	8x10=80	8x11=88	8x12=96
9x1=9	9x2=18	9x3=27	9x4=36	9x5=45	9x6=54	9x7=63	9x8=72	9x9=81	9x10=90	9x11=99	9x12=108
10x1=10	10x2=20	10x3=30	10x4=40	10x5=50	10x6=60	10x7=70	10x8=80	10x9=90	10x10=100	10x11=110	10x12=120
11x1=11	11x2=22	11x3=33	11x4=44	11x5=55	11x6=66	11x7=77	11x8=88	11x9=99	11x10=110	11x11=121	11x12=132
12x1=12	12x2=24	12x3=36	12x4=48	12x5=60	12x6=72	12x7=84	12x8=96	12x9=108	12x10=120	12x11=132	12x12=144

MULTIPLICATION SECRETS!!!!

Here are the secrets for learning multiplication. You can see the examples on the chart by finding the colored pattern.

 Find this pattern on the chart

Twin Facts

You don't have to learn the facts in the dark colored section because all of them have a twin in the uncolored section.
If you learn the facts in the uncolored section, you will automatically know their twin fact. For example, if you know 8x6=48, then you know that 6x8=48.
This is the **commutative property of multiplication**.
It doesn't matter which order the factors are in--you still get the same answer!

 Find this pattern on the chart

Times One for Free

These are so easy, it's like you get an answer for free!!
Any number times 1 equals that same number.

1x1=1	3x1=3	5x1=5	7x1=7	9x1=9	11x1=11
2x1=2	4x1=4	6x1=6	8x1=8	10x1=10	12x1=12

 Find this pattern on the chart:

Times Two

When you multiply a number by two, you just add the number to itself. So 7x2 is the same as 7+7.

1x2=2	3x2=6	5x2=10	7x2=14	9x2=18	11x2=22
2x2=4	4x2=8	6x2=12	8x2=16	10x2=20	12x2=24

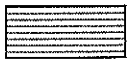
 Find this pattern on the chart:

Times Five Pattern

Multiplying 5 seems easy. Maybe because we "practice" them a lot in earlier grades. (which goes to show what practicing the other harder facts will do for you!!) The last digit always goes 5, 0, 5, 0.

A trick: 5 is half of 10, right? So when multiplying a number by 5, you can first multiply it by 10, then figure out half of the product. Example: 8x5 Think: 8x10 is 80 and 1/2 of 80 = 40, so 8x5=40

1x5=5	3x5=15	5x5=25	7x5=35	9x5=45	11x5=55
2x5=10	4x5=20	6x5=30	8x5=40	10x5=50	12x5=60

 Find this pattern on the chart:

Times Four

If you know how to double a number, this one is easy. Double the number and then double it again!
Example: 6x4 Double the 6 (12) and then double it again (24) 6x4=24

1x4=4	3x4=12	5x4=20	7x4=28	9x4=36	11x4=44
2x4=8	4x4=16	6x4=24	8x4=32	10x4=40	12x4=48

Find this pattern on the chart:

Times TEN for Free

These are so easy, you don't have to even think about them!! Just add a zero after the number. For example 3 x 10 = 3**0**

1x10=10	3x10=30	5x10=50	7x10=70	9x10=90	11x10=110
2x10=20	4x10=40	6x10=60	8x10=80	10x10=100	12x10=120

Find this pattern on the chart:

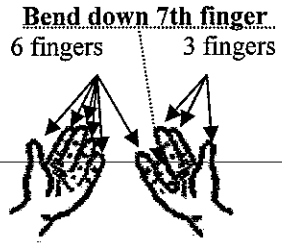
Times Nine Tricks

***Note: these only work with factors up to 9**

To multiply a number by nine, multiply it first by ten (which is easy!) and then subtract the number.
To find 6x9, think 6x10= 60 - 6 = 54

OR

Hold both your hands in front of you. Count as many fingers as the number by which you multiply nine, starting from the left. Bend that finger. The number of fingers to the left of the bent finger will be the first digit of the answer, and the number of fingers to the right of it will be the second digit of the answer.
(See example) If you multiply 9 by 7, bend down the seventh finger. There are 6 fingers to the left of that finger and 3 fingers to the right of that finger. The answer is 63.



7 x 9 = 63

OR

The first digit of the product of a number times 9 is one less than that number.
Example: When you multiply 9x8, the first digit of the answer is 7. The sum of the digits is 9, so figure out what you add to 7 to get 9. The answer is 72.

1x9=9	3x9=27	5x9=45	7x9=63	9x9=91
2x9=18	4x9=36	6x9=54	8x9=72	

Find this pattern on the chart:

Times Eleven

Multiplication by 11 is very easy, especially for 1 through 9--Simply repeat the digit: 7x11=77

Here is a trick to multiply 2 digit numbers by 11. Write down the number you are multiplying with a space between the two numbers. Then add the two digits and write down the sum in the space.
Example: 12x11 Write down 1__2. Add those numbers and write the sum in the space. 1**3**2 11x12=132

If the sum is a two-digit number, write down the ones in the space and carry the tens to the number to the left of the space.
75x11 Write down 7___5. Add 7+5=12. Write the 2 in the space and add the 1 to the 7.
Answer: 825

1x11=11	3x11=33	5x11=55	7x11=77	9x11=99	11x11=121
2x11=22	4x11=44	6x11=66	8x11=88	10x11=110	12x11=132

Find this pattern on the chart:

Remember the Squares

Most of us can usually remember the squares when we multiply a number by itself.
3x3=9 6x6=36 7x7=49 8x8=64

1x1=1	3x3=9	5x5=25	7x7=49	9x9=81	11x11=121
2x2=4	4x4=16	6x6=36	8x8=64	10x10=100	12x12=144

1x1=1	1x2=2	1x3=3	1x4=4	1x5=5	1x6=6	1x7=7	1x8=8	1x9=9	1x10=10	1x11=11	1x12=12
2x1=2	2x2=4	2x3=6	2x4=8	2x5=10	2x6=12	2x7=14	2x8=16	2x9=18	2x10=20	2x11=22	2x12=24
3x1=3	3x2=6	3x3=9	3x4=12	3x5=15	3x6=18	3x7=21	3x8=24	3x9=27	3x10=30	3x11=33	3x12=36
4x1=4	4x2=8	4x3=12	4x4=16	4x5=20	4x6=24	4x7=28	4x8=32	4x9=36	4x10=40	4x11=44	4x12=48
5x1=5	5x2=10	5x3=15	5x4=20	5x5=25	5x6=30	5x7=35	5x8=40	5x9=45	5x10=50	5x11=55	5x12=60
6x1=6	6x2=12	6x3=18	6x4=24	6x5=30	6x6=36	6x7=42	6x8=48	6x9=54	6x10=60	6x11=66	6x12=72
7x1=7	7x2=14	7x3=21	7x4=28	7x5=35	7x6=42	7x7=49	7x8=56	7x9=63	7x10=70	7x11=77	7x12=84
8x1=8	8x2=16	8x3=24	8x4=32	8x5=40	8x6=48	8x7=56	8x8=64	8x9=72	8x10=80	8x11=88	8x12=96
9x1=9	9x2=18	9x3=27	9x4=36	9x5=45	9x6=54	9x7=63	9x8=72	9x9=81	9x10=90	9x11=99	9x12=108
10x1=10	10x2=20	10x3=30	10x4=40	10x5=50	10x6=60	10x7=70	10x8=80	10x9=90	10x10=100	10x11=110	10x12=120
11x1=11	11x2=22	11x3=33	11x4=44	11x5=55	11x6=66	11x7=77	11x8=88	11x9=99	11x10=110	11x11=121	11x12=132
12x1=12	12x2=24	12x3=36	12x4=48	12x5=60	12x6=72	12x7=84	12x8=96	12x9=108	12x10=120	12x11=132	12x12=144

Here is a blank chart for you.
Color in the facts you already know. (Do not color a fact if you have *ANY* trouble with it.)

Write the facts which are left on index cards or strips of paper. Practice them EVERY DAY!!! Get someone to help you study. They can ask you questions about the facts all through the day. Play games with these facts. Display the facts all over your house so that you think about them a lot.
Pretty soon, these facts will be so easy to you!!

Websites:
http://www.multiplication.com/interactive_games.htm
http://www.naturalmath.com/mult/mult2.html
http://www.aaamath.com/mul.htm
http://www.gamequarium.com/multiplication.html
http://www.coolmath4kids.com/
http://www.aplusmath.com/

Multiplication Chart

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Multiplication Games

See Attached Games:

Flip-Flop-Flow (Tic-Tac-Toe)
Googol Power Bingo
Flip It and Multiply
Dodecahedron Dice (can be used to create your own games)

Directions for More Games:

Multiplication War

Materials:
A deck of cards (or one deck for each player)
Directions for 2 Players:

- Number cards will have the value of the number on the card. (For example, 3 of hearts = 3)
- The values for the face cards: Ace=1 , Jack=0, Queen=11, King=12(Remove jokers)
- Begin by shuffling the deck and dealing all cards out to the two players. This game is played quite similarly to traditional "war".
- The players each turn a card over at the same time. The first person to correctly state the product of the cards they see wins the two cards. (You can also require players to say the number sentence, e.g. "9 times 2 is 18" instead of just "18".)
- If there is a tie in naming the product, "war" begins. Keep turning cards until someone wins the pile.

Play ends when either player has all the cards. The winner is the player with the most cards.

Multiplication Touch

Materials (see attached sheets):
Game board (2 pages)
Product cards (2 pages)

Tape together the two sides of the game board. Cut product cards apart.

How to play
Put the game board in the middle. The product cards are placed upside down over to one side. Each player will draw seven cards. One additional card is drawn and placed on the playing grid where it would be the correct product.
Remember that each number can be placed in at least two spots (for example, 21 can be placed for 3x7 or 7x3) and some can be placed in several spots (for example, 24).

After the first card is placed on the board, players take turns adding a card. However, in order to place a card it must touch a spot which already has a card in it. If the player cannot place a card, he must draw one from the centre pile and his turn ends (even if he can place this new card).

The winner is the first player to place all of his cards.

TIC-TAC-TOE (FLIP-FLOP-FLOW) MULTIPLICATION

Game Instructions: The same as normal Tic-Tac-Toe except that you have to answer the math fact before you draw your X or O. Children can use their times table chart to look up the answers. Make up your own game!

2X's

2X3	2X12	2X11
2X9	2X7	2X4
2X8	2X5	2X6

5X's

5X5	5X7	5X4
5X6	5X10	5X12
5X3	5X2	5X8

Tricky Ones

8X8	3X3	4X4
2X2	6X6	7X7
9X9	11X11	12X12

Tricky Ones

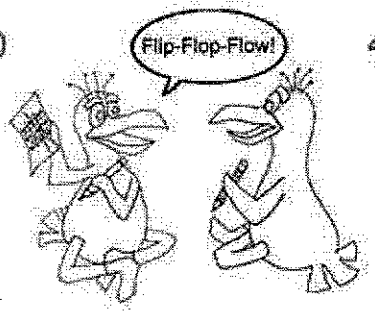
8X7	8X3	11X12
12X7	6X7	9X8
6X9	13X13	9X12

9X's

9X2	9X12	9X5
9X6	9X3	9X8
9X4	9X7	9X10

4X's

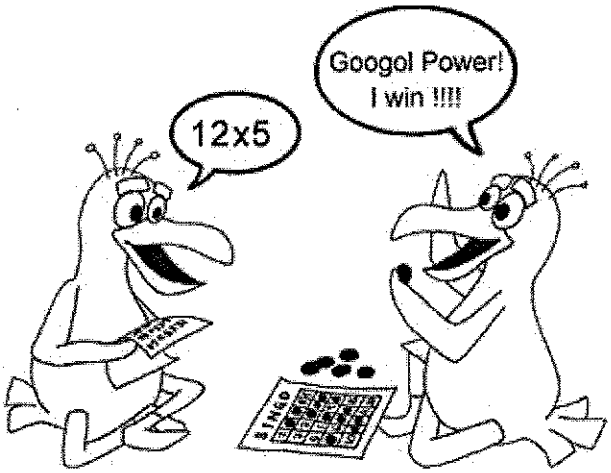
4X2	4X7	4X6
4X8	4X3	4X4
4X9	4X10	4X12



Can you make up your own game?

GOOGOL POWER BINGO

Preparation: Fill in products or sums from your multiplication or addition chart.
Instructions: Caller can use their times table or addition chart to pick the equations to call out. Put a chip or a coin on the answer for the equation called. Play to cover five in a row or the whole board. Winner yells Googol Power!



Flip It & Multiply

Number of players: 2

Materials:

A deck of playing cards (eliminating the face cards)

Objective:

The player with the most cards at the end is the winner.

Directions:

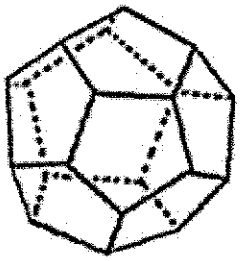
1. Mix the cards and deal them evenly to each player. Players place their stack of cards facedown in front of them.
2. Players simultaneously say, "1-2-3 Flip It" and turn over the top 2 cards from each of their piles.
3. Each player finds the product of his or her own two cards. *(For example, if a player flips a 7 and a 8, then the player multiplies 7x8 to get 56.)* Both players call out their products.
4. The player with the greatest product takes all four cards and places them in a separate pile. *(For example, if player one flips a 9 and 3 and player two flips a 6 and 7 then player two is the winner of that hand because 42 (6x7) is greater than 27 (9x3)).*
5. Play continues until all cards in the pile have been flipped or until time runs out.
6. If both players have the same product, then the players flip 2 more cards each. The player with greatest product keeps all 8 cards.

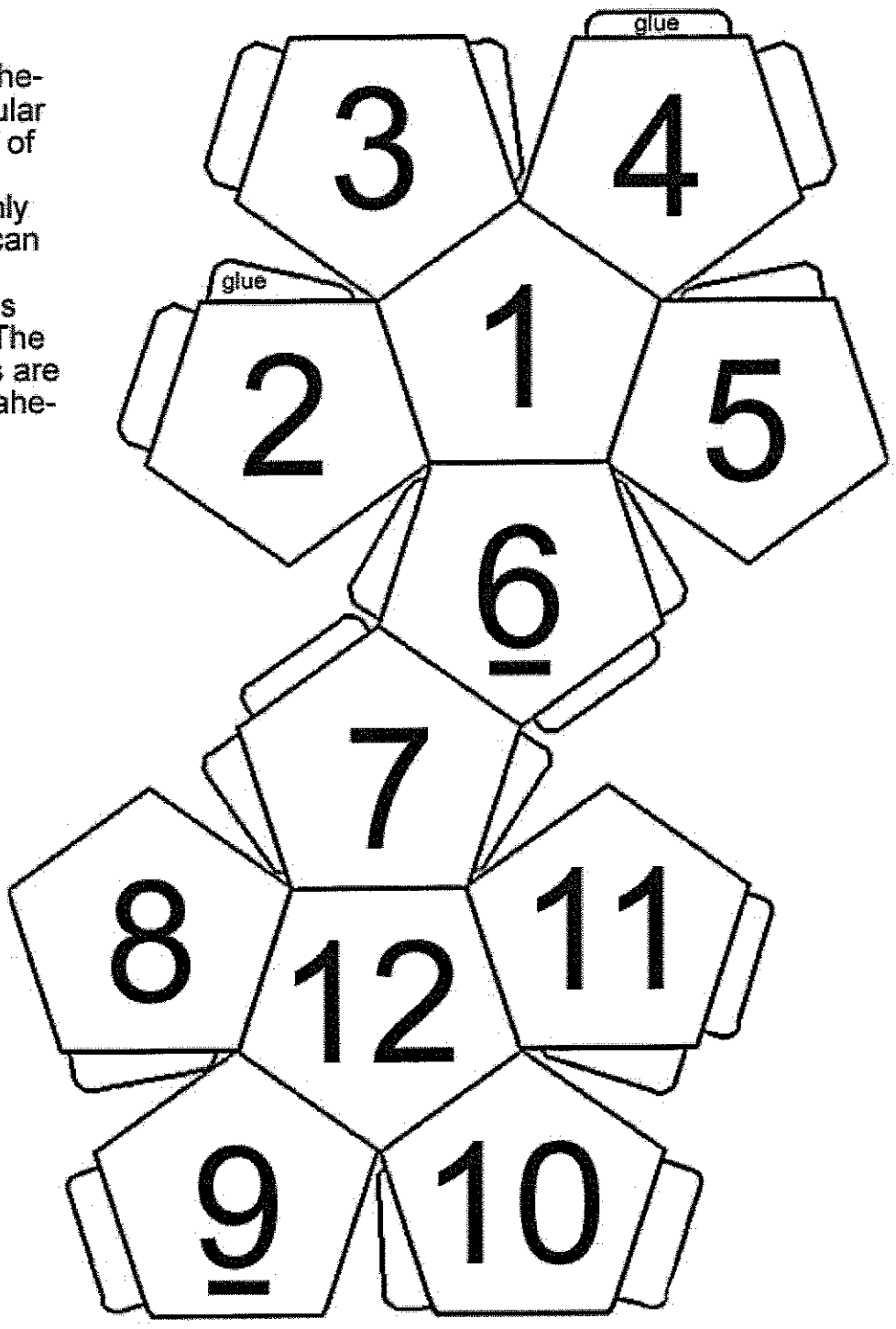
CREATE YOUR OWN DODECAHEDRON SET OF DICE

Instructions: Cut along the edges and decorate if desired. Fold along lines and put together with glue or tape along edges. Make two so you have a pair of dice.

Game instructions: Roll as dice and use the two rolled numbers as factors to try to find the product. These can also be used to practice addition. Make up a game and see who can roll the highest product or sum. Use any gameboard. The player with the highest product or sum rolled gets to advance their piece.

Dodecahedron: A dodecahedron is a twelve-sided regular geometric solid composed of twelve pentagons. The dodecahedron is one of only five geometric solids that can be made with the same number of regular polygons meeting at each corner. (The other four geometric solids are the tetrahedron, cube, octahedron and icosahedron.





Multiplication Touch Game (left side of board)

x	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
x	1	2	3	4	5	6

Multiplication Touch Game (right side of board)

7	8	9	10	11	12	x
						1
						2
						3
						4
						5
						6
						7
						8
						9
						10
						11
						12
7	8	9	10	11	12	x

Multiplication Touch Game Counters (page 1)

1	2	3	4	5	6
2	4	6	8	10	12
3	6	9	12	15	18
4	8	12	16	20	24
5	10	15	20	25	30
6	12	18	24	30	36
7	14	21	28	35	42
8	16	24	32	40	48
9	18	27	36	45	54
10	20	30	40	50	60
11	22	33	44	55	66
12	24	36	48	60	72

Multiplication Touch Game Counters (page 2)

7	8	9	10	11	12
14	16	18	20	22	24
21	24	27	30	33	36
28	32	36	40	44	48
35	40	45	50	55	60
42	48	54	60	66	72
49	56	63	70	77	84
56	64	72	80	88	96
63	72	81	90	99	108
70	80	90	100	110	120
77	88	99	110	121	132
84	96	108	120	132	144