

Math Magic: MATH BASICS, THEN AND NOW, SIMPLIFIED

Issue #1: Lesson Plans on teacher-tested Activities to help learn the basic 36 Multiplication Facts...for those who didn't at first.

MATH FACTS ARE THE FOUNDATION OF ALL COMPUTATION AND LIFE-LONG CONFIDENCE

Many middle and even high school students' difficulty with math comes from not knowing basic computation skills, starting with addition and multiplication facts. Even Sal Kahn of The Kahn Academy admits that it is important to know these basics. However there are many clever tricks using Math Fluency which can assist students in this process. Oftentimes students and adults are embarrassed that they do not know their basic estimation skills even to check a receipt. Or a bill. Much anxiety arises in trying to drill students. Below is a fun and effective plan I developed 40+ years ago to help 4-6 grade students learn their X TABLES. Patricia used them successfully at Orion as a volunteer parent.

FIRST, REDUCE THE FACTS FROM 144 TO 36

Eliminate the 0's, 1's, 10's, and 11's multiplication facts since these are most likely known and easy to learn. I drop the 12's for the time being since they can be figured from the single digit facts. There is so much more than rote memorization here.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Finally, eliminate those facts which repeat themselves because of the commutative principle. Since $4 \times 5 = 5 \times 4$, just use one of them.

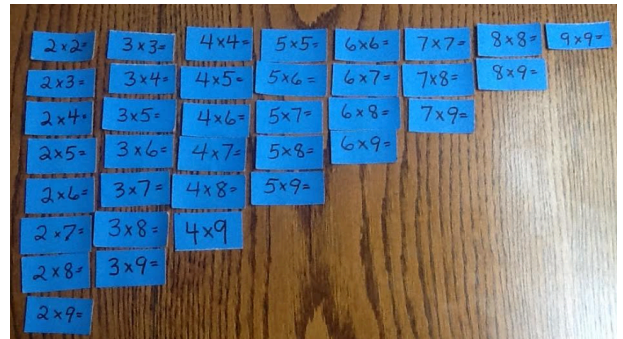
However, I have found that a simple pre-test will show that most students know most of these. Now the scope of the task becomes much more manageable and less stress producing. This can be done by using the basic 36 flash cards or the basic 36 facts on a smart phone or tablet. —>

CREATING A SET OF 36 OF MINI-FLASH CARDS

We found that 36 1 x 2 inch cards made out of tagboard and held together with a rubber band was the ideal size for children to carry (hide?) in pockets, purses, or binders; and play games on a desktop. Cards may be pre-cut by parents using a paper cutter or older students practicing their scissoring skills. Tagboard can be of different colors to identify. The student(s) uses a pencil (lightly) to write in each multiplication problem large and neat on one side and the correct answer on the back as shown in the picture below. Before darkening in the pencil, answers should be double-checked for each multiplication problem. Students make great helpers.

USING THE MINI FLASHCARDS IN A CLASSROOM AND/OR AT HOME

Each student has a folder which contains: 1) a record of the daily 90 second quizzes taken; 2) 2 sets of mini flashcards. 3) other worksheets to extend the



The Basic 36 Multiplication Facts w/out repeats

concepts. To use, cards are spread on a desk, answers facing down. A timer is set, and any card is read and answered aloud and flipped over to be put in a "correct" or "incorrect" answer pile. The number correctly answered is recorded on the graph, and he missed ones noted. The process is repeated by the other partner. I have older upper graders figure and enter their percent correct by one of several methods.

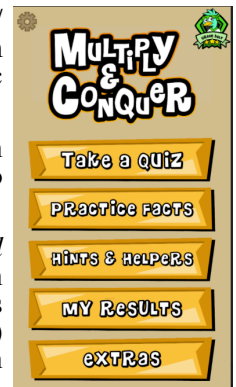
CHILDREN LOVE MAKING GAMES TO PLAY

Be it soccer, baseball, football, race cars, etc., students invent their own games which are run by how many flashcards one can answer in x-seconds. Testing each other they soon discover each other's weaknesses and zero in on what facts need to be learned. Sometimes, they (Drew and Duke) actually "took time for a pit stop to study."

Every so often a player can give his/her partner a bonus problem reviewing relevant school basic computation, fractions, decimals, etc.

Such as what's -8×7 , or what is n in $4n = 32$, or "4 squared" or "4 to the second power."

It's about friendly competition and team progress. Students can also earn different titles and certificates (master, journey-person, apprentice) depending how fast they can test on the thirty-six facts at 100% accuracy.



Several years ago David and I worked on this multiplication app, but it also offers other games he wrote for smart phones and tablets. For all ages— all artistic, fun, and educational. Easier to give away than sell. -Joe B