Multiplication/Division 3 – Facts

This packet can help you learn these multiplication facts and the division facts (on the back) that go with them.

Contents:

Instruction:

- Coach's Notes
- 3 Facts: More Strategy tips
- 3 Facts: Add & Subtract to Multiply and Divide
- 3 Facts: Fact Families

Games:

- Flashcard Maze (Mult or Div)
- Capture the Box (Mult)
- Great Turtle Race (Mult)
- Great Turtle Race (Div)
- Race or Bump (Mult)
- Bingo (Div)
- Fact Family Steal! (both)
- Trade the Trash/Concentration (both or either)

Flash Cards:

3-Fact Multiplication

3-Fact Division

X	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Printing: Black & White, landscape, 2-sided, flip on short edge.

0 ÷ 1 = 0	0 ÷ 2= 0	$0 \div 3 = 0$	0 ÷ 4 = 0	0 ÷ 5 = 0
1 ÷ 1 = 1	2 ÷ 2 = 1	3 ÷ 3 = 1	4 ÷ 4= 1	5 ÷ 5 = 1
2 ÷ 1 = 2	4 ÷ 2 = 2	6 ÷ 3 = 2	8 ÷ 4 = 2	10 ÷ 5 = 2
3 ÷ 1 = 3	6 ÷ 2 = 3	9 ÷ 3 = 3	12 ÷ 4 = 3	15 ÷ 5 = 3
4 ÷ 1 = 4	8 ÷ 2 = 4	$12 \div 3 = 4$	16 ÷ 4 = 4	20 ÷ 5 = 4
5 ÷ 1 = 5	10 ÷ 2 = 5	15 ÷ 3 = 5	20 ÷ 4 = 5	25 ÷ 5 = 5
6 ÷ 1 = 6	12 ÷ 2 = 6	18 ÷ 3 = 6	24 ÷ 4 = 6	30 ÷ 5 = 6
7 ÷ 1 = 7	14 ÷ 2 = 7	21 ÷ 3 = 7	28 ÷ 4 = 7	35 ÷ 5 = 7
8 ÷ 1 = 8	16 ÷ 2 = 8	24 ÷ 3 = 8	32 ÷ 4 = 8	40 ÷ 5 = 8
9 ÷ 1 = 9	18 ÷ 2 = 9	27 ÷ 3 = 9	36 ÷ 4 = 9	45 ÷ 5 = 9
10 ÷ 1 = 10	20 ÷ 2 = 10	30 ÷ 3 = 10	40 ÷ 4 = 10	50 ÷ 5 = 10
0 ÷ 6 = 0	0 ÷ 7 = 0	0 ÷ 8 = 0	0 ÷ 9 = 0	0 ÷ 10 = 0
6 ÷ 6 = 1	7 ÷ 7 = 1	8 ÷ 8 = 1	9÷9=1	10 ÷ 10 = 1
12 ÷ 6 = 2	14 ÷ 7 = 2	16 ÷ 8 = 2	18 ÷ 9 = 2	20 ÷ 10 = 2
18 ÷ 6 = 3	21 ÷ 7 = 3	24 ÷ 8 = 3	27 ÷ 9 = 3	30 ÷ 10 = 3
24 ÷ 6 = 4	28 ÷ 7 = 4	32 ÷ 8 = 4	36 ÷ 9 = 4	40 ÷ 10 = 4
30 ÷ 6 = 5	35 ÷ 7 = 5	40 ÷ 8 = 5	45 ÷ 9 = 5	50 ÷ 10 = 5
36 ÷ 6 = 6	42 ÷ 7 = 6	48 ÷ 8 = 6	54 ÷ 9 = 6	60 ÷ 10 = 6
42 ÷ 6= 7	49 ÷ 7 = 7	56 ÷ 8 = 7	63 ÷ 9 = 7	70 ÷ 10 = 7
48 ÷ 6 = 8	56 ÷ 7 = 8	64 ÷ 8 = 8	72 ÷ 9 = 8	80 ÷ 10 = 8
54 ÷ 6 = 9	63 ÷ 7 = 9	72 ÷ 8 = 9	81 ÷ 9 = 9	90 ÷ 10 = 9
60 ÷ 6 = 10	70 ÷ 7 = 10	80 ÷ 8 = 10	90 ÷ 9 = 10	100 ÷ 10 = 10

Coach's Notes

These fact packets are meant to be a part of the "Personal Best" fact fluency program, so be sure to read the information about how that program is meant to work.

Philosophy

These packets are based on the philosophy that it is helpful for students to understand the commutative property (2 X 3 = 3 X 2) from the very beginning and also to understand the close relationship between multiplication and division from the very beginning. So, the multiplication and division facts are all included.

Daily routine:

It is helpful to have a daily routine for Fluency Practice. Here is what I suggest:

Pick a set of target facts. If the student is ready, you can work on all the facts in the packet at once. If that is overwhelming, feel free to work on either multiplication or division separately, or to pick out a few fact families to work on at a time – but pick a set of target facts to work on each day, with the goal of working on all of them eventually.

Then every day:

1. Have the students write the target facts on their white boards at least once from memory (3 X 1 = 3, 3 X 2 = 6, 3 X 3 = 9, etc.) as a warm-up.

2. Shuffle the flashcards for your target facts and run through them once, having the student place them in two stacks – 1 stack of cards they have mastered, and 1 stack that either they get wrong or take a long time to figure out. Practice the second stack a couple of extra times.

Once you have done that, you can go over some of the instructional material if needed or play a review game.

Note: You may not have time to play a game every day, but I would at least try to do steps 1 and 2 every day. Maybe play a game every Friday or every other day. Research shows that a little practice on facts every day is more effective than trying to do a whole lot at once.

Strategy tips for 3s

You probably already know your 2-Facts. If you do, it is pretty easy to learn your 3-facts. You multiply by 2 and then just add 1 more set.

For example:

3 X 2 = 6. If it helps you can think: 2 sets of 2 equals 4, plus one more set of 2 equals 6.
3 X 4 = 12. If it helps, you can think: 2 sets of 4 equals 8, plus one more set of 4 equals 12.
3 X 5 = 15. If it helps, you can think: 2 sets of 5 equals 10, plus one more set of 5 equals 15.

Another way of thinking of multiplying by 3 is "tripling." Just adding the number 3 times.

For example:

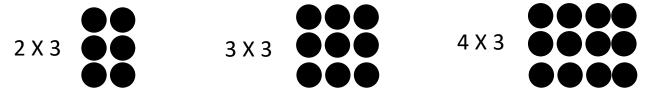
3 X 2 = 6. That is the same as 2 + 2 + 2 = 6. 3 X 5 = 15. That is the same as 5 + 5 + 5 = 15.

3X facts, 6X facts and 9X facts are all related – so once you know one set of facts it can help you remember the rest.

3X	6X = 3X + 3X	9X = 3X + 3X + 3X
3X2 = 6	6X2 = (3X2) + (3X2) = 12 6X2 = 6 + 6 = 12	9X2 = (3X2) + (3X2) + (3X2) = 18 9X2 = 6 + 6 + 6 = 18

3 Facts: Add and Subtract to Multiply and Divide

You can think of multiplication as a special kind of adding. It is adding groups of the same size together multiple times. In this case, we will be adding multiple groups of 3. It's usually easier to learn something new in math if you start with something you can touch with your hands. On your first day of 3-Facts, get out the beans (or other counters) and practice making the different 3-facts. You can place them in arrays like the picture below to get the "feel" of how multiplication works.



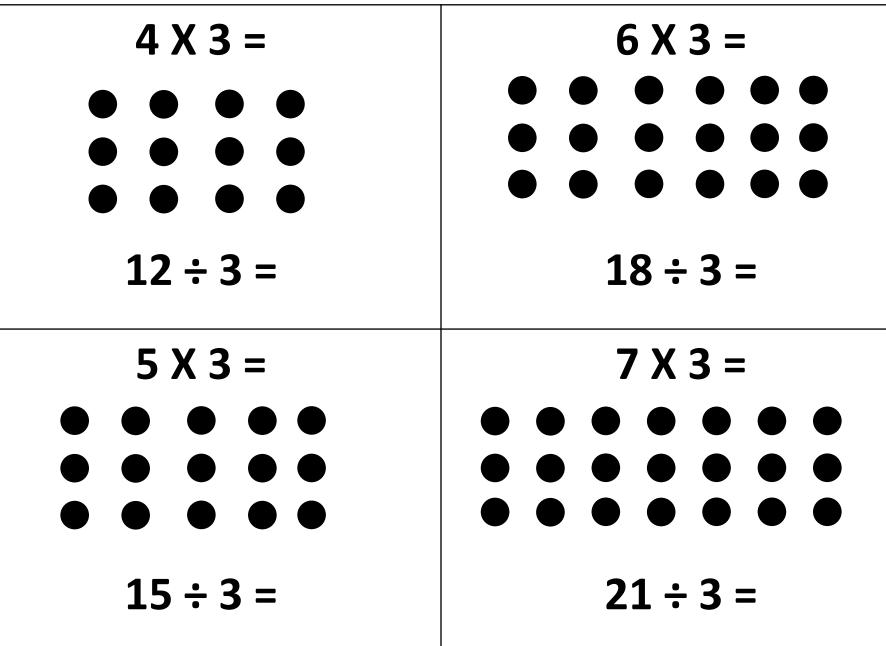
Can you figure out these facts by making an array for each one?

5 X 3 =	6 X 3 =	7 X 3 =

Just like multiplication is really a special kind of adding, division is really a special kind of subtracting. It is subtracting groups of the same size multiple times. For example, if you are trying to figure out the problem 6 ÷ 2, you are really asking, "How many times can I subtract groups of 3 out of a group of 9 before I have taken it all?" Another way of saying it is "How many times does 3 go into 9?"

Here's how you would figure out 9 ÷ 3 by subtracting groups of 3	Start with a group of 6.	Subtract 3 one time.	Subtract 3 two times.	Subtract 3 three times. Now I have taken all 9.	When you subtract 3 groups of 3 from 9, you have taken it all. So, 3 "goes into" 9
					three times. 9 ÷ 3 = 3.

Adding and subtracting to multiply and divide can take a long time, so you will want to learn other strategies, but adding and subtracting can help you if you get stuck. Here are a few problems for you to practice this strategy. Use the arrays to help you find the answers.



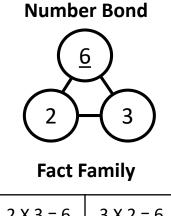
3 Facts: Fact Families

The 3X facts and the \div 3 facts have a relationship to each other. Because of this relationship, we sometimes say they are in the same "fact family." Sometimes you will see this relationship explained as a "number bond," like in the picture to the right (\rightarrow).

If you understand about fact families and number bonds, you can figure out four different math facts (two multiplication facts and two division facts) if you only know one!

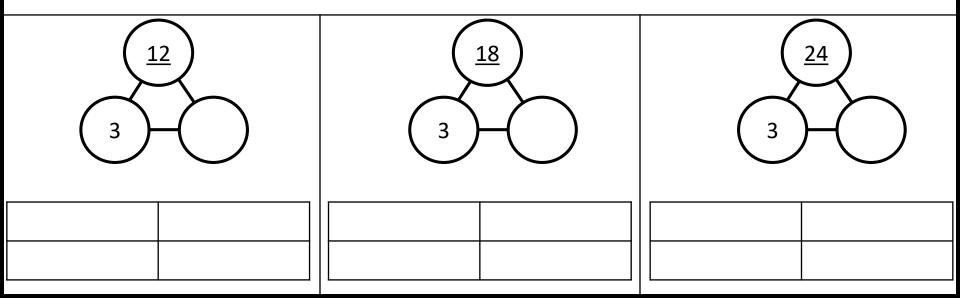
Here's how it works. Let's say you are trying to solve the division problem $6 \div 3 = ?$

You already know the multiplication fact " $2 \times 3 = 6$," so you can **think of the Fact Family** and ask yourself, "3 times WHAT equals 6?" You already know the answer to that! It's 2!



6 ÷ 2 = 3 6 ÷ 3 = 2	2 X 3 = 6	3 X 2 = 6
	6 ÷ 2 = 3	6 ÷ 3 = 2

Use your knowledge of the relationship between multiplication and division to complete these number bonds and then complete the fact families that go with them.



Try these problems. If you don't know an answer, try using your knowledge of fact families to figure it out.

3 X 8 =	24÷3=	24÷8=
3 X 6 =	18÷3=	18÷6 =

Flashcard Maze (Multiplication/Division)

Materials needed:

- Flashcards (You can play with just multiplication, just division, or mixed)
- 6-sided die
- Game pieces

Prep:

Lay out the flashcards in a maze, face down.

To Play:

Take turns rolling the dice and moving that number of spaces on the maze. When you land on a card, turn it over and answer the problem. If you get it correct, you get to stay in that place. If not, you have to go back to where you were before you rolled.

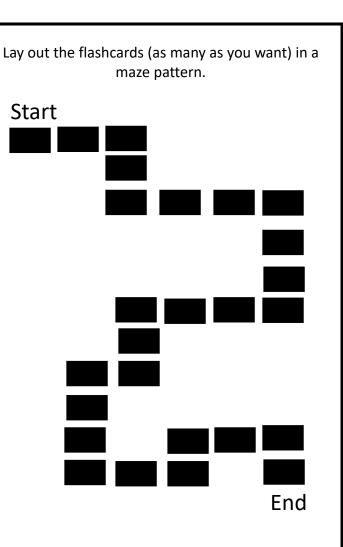
If you land on a card that has already been turned over, you must say a problem that is in the same fact family. For example, if you land on "6 X 3," but it has already been answered. You can say "6 X 3 = 18, so $18 \div 6 = 3$."

If you land on a card where the answer is 0, move 2 spaces back (but do not turn over that card).

If you land on a card where the answer is a multiple of 10 (10, 20, 30, 40, etc.) move 2 extra spaces forward (but do not turn over that card).

To win:

First player to complete the maze wins.



3	6	9	12	15
18	21	24	27	30
3	6	9	12	15
18	21	24	27	30
3	6	9	12	15
18	21	24	27	30

Capture the Box 3 Multiplication Facts

Materials needed:

- Capture the box gameboard
- 10-sided dice
- Different colored dry-erase marker for each player

To Play:

Player 1 rolls the 10-sided die (0 counts as 10) and multiplies his roll by 3 and says the problem and answer out loud (3 X 4 = 12) to get one of the numbers on the board. He then draws a line on one side of the box that contains that number.

If the player's line completes a box, that means he captures it and gets to put his initials in it. If the line completes two boxes, the player captures/initials both boxes.

If there are no lines you can draw with your roll, you lose your turn and the next player rolls.

To win:

Play until all boxes have been captured, the player who captured the most boxes wins. (Or you can set a timer and play till time runs out.)

The Great Turtle Race – 3 Multiplication Facts

Materials Needed:

- Turtle Race game boards
- 6-sided die
- Dry erase boards/Markers/Erasers
- 6 "Turtles" (game counters) per player

To play:

Each Player puts a turtle (game counter) in the first space of each "lane" on his/her racing card.

Player 1 rolls the die and answers the math problem in the next available space in the lane with the number corresponding to the roll of the dice. If the answer is correct, move the turtle for that lane one space forward. Then it is player 2's turn.

AS ALWAYS: Any player who rolls the dice off the table loses a turn.

To win: First player to get 3 turtles across the finish line wins.



The Great Turtle Race

1	3 X 5	3 X 2	3 X 4	3 X 3	3 X 1	3 X 8	Finish!
2	3 X 9	3 X 6	3 X 7	3 X 10	3 X 8	3 X 1	Finish
3	3 X 6	3 X 9	3 X 10	3 X 7	3 X 3	3 X 4	Finish!
4	3 X 2	3 X 5	3 X 3	3 X 9	3 X 1	3 X 8	Finish!
5	3 X 5	3 X 4	3 X 2	3 X 7	3 X 10	3 X 6	Finish!
6	3 X 4	3 X 5	3 X 8	3 X 6	3 X 10	3 X 2	Finish!

The Great Turtle Race – 3 Division Facts

Materials Needed:

- Turtle Race game boards
- 6-sided die
- Dry erase boards/Markers/Erasers
- 6 "Turtles" (game counters) per player

To play:

Each Player puts a turtle (game counter) in the first space of each "lane" on his/her racing card.

Player 1 rolls the die and answers the math problem in the next available space in the lane with the number corresponding to the roll of the dice. If the answer is correct, move the turtle for that lane one space forward. Then it is player 2's turn.

AS ALWAYS: Any player who rolls the dice off the table loses a turn.

To win: First player to get 3 turtles across the finish line wins.



The Great Turtle Race

Finish!	Finish!	Finish!	Finish!	Finish!
12 ÷ 3	3 ÷ 3	12 ÷ 3	24 ÷ 3	
3 ÷ 3	24 ÷ 3	9÷3	3 ÷ 3	
18÷3	30 ÷ 3	21 ÷ 3	27 ÷ 3	
12 ÷ 3	21 ÷ 3	30 ÷ 3	9÷3	
 6 ÷ 3	18÷3	27 ÷ 3	15 ÷ 3	1
15 ÷ 3	24 ÷ 3	18÷3	6 ÷ 3	
1	2	3	4	

The Great Turtle Race – 3 Multiplication Facts

Materials Needed:

- Turtle Race game boards
- 6-sided die
- Dry erase boards/Markers/Erasers
- 6 "Turtles" (game counters) per player

To play:

Each Player puts a turtle (game counter) in the first space of each "lane" on his/her racing card.

Player 1 rolls the die and answers the math problem in the next available space in the lane with the number corresponding to the roll of the dice. If the answer is correct, move the turtle for that lane one space forward. Then it is player 2's turn.

AS ALWAYS: Any player who rolls the dice off the table loses a turn.

To win: First player to get 3 turtles across the finish line wins.



The Great Turtle Race

1	3 X 5	3 X 2	3 X 4	3 X 3	3 X 1	3 X 8	Finish!
2	3 X 9	3 X 6	3 X 7	3 X 10	3 X 8	3 X 1	Finish
3	3 X 6	3 X 9	3 X 10	3 X 7	3 X 3	3 X 4	Finish!
4	3 X 2	3 X 5	3 X 3	3 X 9	3 X 1	3 X 8	Finish!
5	3 X 5	3 X 4	3 X 2	3 X 7	3 X 10	3 X 6	Finish!
6	3 X 4	3 X 5	3 X 8	3 X 6	3 X 10	3 X 2	Finish!

The Great Turtle Race – 3 Division Facts

Materials Needed:

- Turtle Race game boards
- 6-sided die
- Dry erase boards/Markers/Erasers
- 6 "Turtles" (game counters) per player

To play:

Each Player puts a turtle (game counter) in the first space of each "lane" on his/her racing card.

Player 1 rolls the die and answers the math problem in the next available space in the lane with the number corresponding to the roll of the dice. If the answer is correct, move the turtle for that lane one space forward. Then it is player 2's turn.

AS ALWAYS: Any player who rolls the dice off the table loses a turn.

To win: First player to get 3 turtles across the finish line wins.



The Great Turtle Race

Finish!	Finish!	Finish!	Finish!	Finish!
12 ÷ 3	3 ÷ 3	12 ÷ 3	24 ÷ 3	
3 ÷ 3	24 ÷ 3	9÷3	3 ÷ 3	
18÷3	30 ÷ 3	21 ÷ 3	27 ÷ 3	
12 ÷ 3	21 ÷ 3	30 ÷ 3	9÷3	
 6 ÷ 3	18÷3	27 ÷ 3	15 ÷ 3	1
15 ÷ 3	24 ÷ 3	18÷3	6 ÷ 3	
1	2	3	4	

Multiplication Race or Bump – 3's

Materials needed:

- 10-sided die (0 counts as 10)
- 10 game counters per player (a different color for each player)

To play Race:

Object of the game is to be the first person to get all the numbers on the game board. Player 1 rolls the die and multiplies the number on the die X 3 He places his counter next to the answer. Player 2 takes a turn and does the same and so on. If a player gets a number he already has covered, it's the next player's turn. The first player to get all the numbers wins.

To play Bump:

Object of the game is to cover more spaces on the board than the other player. Player 1 rolls the die and multiplies the number on the die X 3. He covers the answer with one of his game counters. Player 2 rolls and does likewise. If a player gets a number that is already covered by the other player's game counter, he "bumps" that counter off and replaces with his counter. The player with the most counters on the board when all the numbers are covered wins.

3
6
9
12
15
18
21
24
27
30

B	Ι	N	G	0
27	30	12	15	3
18	24	9	21	6
21	27	\star	24	9
12	3	30	18	15
6	18	9	6	15

Multiplication Facts – 3s

B	Ι	N	G	0
12	27	3	21	30
24	30	3	24	12
15	6	\star	21	27
9	18	6	18	3
9	30	24	15	12

Multiplication Facts – 3s

Multiplication Bingo

Materials needed:

- Set of Multiplication Flash Cards Well shuffled.
- Dry erase markers/erasers
- Chips or game counters (optional)

To Play:

Players take turns drawing a flashcard and answering the problem. Once the problem is answered correctly, all players can mark out the corresponding number on their bingo cards. If you run out of cards before someone "bingos" – just reshuffle the cards and keep going.

To win:

First player with 5 in a row in any direction (down, across, diagonal) wins.

Multiplication Bingo

Materials needed:

- Set of Multiplication Flash Cards Well shuffled.
- Dry erase markers/erasers
- Chips or game counters (optional)

To Play:

Players take turns drawing a flashcard and answering the problem. Once the problem is answered correctly, all players can mark out the corresponding number on their bingo cards. If you run out of cards before someone "bingos" – just reshuffle the cards and keep going.

To win:

First player with 5 in a row in any direction (down, across, diagonal) wins.

B	Ι	N	G	0
1	5	2	8	4
9	9	4	8	5
3	10	\star	3	1
6	1	2	7	7
2	6	10	4	3

DIVISION FACTS

B	Ι	N	G	0
1	5	9	1	3
4	2	6	10	2
8	5	\star	7	4
1	9	6	3	8
2	3	10	7	4

DIVISION FACTS

Division Bingo

Materials needed:

- Set of Multiplication Flash Cards Well shuffled.
- Dry erase markers/erasers
- Chips or game counters (optional)

To Play:

Players take turns drawing a flashcard and answering the problem. Once the problem is answered correctly, all players can mark out the corresponding number on their bingo cards. If you run out of cards before someone "bingos" – just reshuffle the cards and keep going.

To win:

First player with 5 in a row in any direction (down, across, diagonal) wins.

Division Bingo

Materials needed:

- Set of Multiplication Flash Cards Well shuffled.
- Dry erase markers/erasers
- Chips or game counters (optional)

To Play:

Players take turns drawing a flashcard and answering the problem. Once the problem is answered correctly, all players can mark out the corresponding number on their bingo cards. If you run out of cards before someone "bingos" – just reshuffle the cards and keep going.

To win:

First player with 5 in a row in any direction (down, across, diagonal) wins.

Fact Family Steal

Materials needed:

- Multiplication and Division flashcards for the same fact family (for example, all the X2 and ÷2 flashcards)
- 10 Steal Cards (Be sure to count to make sure you have 10)

Object of the Game: To collect two "books." A "book" is a set with all the multiplication and division facts in the same Fact Family (two multiplication facts and two division facts). For example: 3 X 2, 2 X 3, 6 ÷ 2, 6 ÷ 3.

To play: Shuffle the flash cards and the STEAL! Cards together thoroughly. Put them in a stack face down where everyone can reach them. This is the draw pile.

Players take turns drawing a card and answering the problem by saying the problem and the answer out loud (For example, "3 X 2 = 6"). Once a player has answered a problem correctly, he/she can add it to his/her collection of cards. Cards must be displayed face up where everyone can see them. The rest of the players do the same.

Players continue drawing cards, answering the problems, and placing them face up – grouping them into fact families where appropriate. Once a player gets a complete family, those cards are protected and cannot be stolen.

If a player draws a "STEAL!" card, that player can steal one card from any other player. Once you have used a STEAL! Card, place it in a stack next to the draw pile. If you draw a "STEAL!" card, but there is nothing to steal (for example the first card of the game), place it in the stack next to the draw pile and draw another card. Players cannot save STEAL! Cards. You must use them when you get them.

To win: First player to get two complete books wins. If you run out of cards before one player wins, you can play "sudden death" by having the players take turns stealing from each other until a player gets two complete books.

Trade the Trash

Materials needed:

- Flash cards (Multiplication, Division or both)
- Answer cards make sure you have a correct answer card for each flash card you are using.
- Trade the Trash Cards You will need one Trade the Trash card for every 3 or 4 flash cards you are using.

The object of the game is to collect matching pairs of cards – the math problem and the correct answer (for example $6 \div 2$, and 3). The first player to make 4 pairs is the winner.

Make sure you have the answer card for each flash card. Shuffle the flash cards, answer cards and the Trade the Trash cards together thoroughly. Place them in a stack face down where all players can reach them. This is the draw stack.

Players take turns either drawing or trading cards, and making pairs. You can do 1 of these two things when it is your turn – but not both.

- Draw Player takes the top card from the draw stack and makes any possible pair with the cards they already have. If the player draws a "Trade the Trash" card, they can save that to use at a later time.
- Trade if a player has a "Trade the Trash" card, they can use their turn to trade a card they don't need for a card they do need from another player. (The other player does not have a choice in the matter.) Place used "Trade the Trash" cards in a pile next to the Draw pile.

Once a pair is made, those cards are protected and cannot be traded. First player to make 4 pairs wins.

Players must display all the cards they have available for trading so everyone can see them. If I player has more than one "Trade the Trash" card they can trade extras for other cards they need.

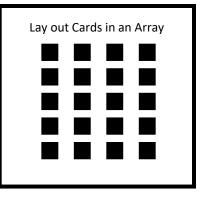
Concentration

Materials needed:

• 10 sets of flashcards and their matching answer cards (20 cards in all)

Lay the cards out in a 4 X 5 array (See picture to the right).

Players take turns turning over two cards. If the cards "match" – the correct problem and the correct answer -- then the player keeps the two cards and tries again. If they do not match, the player turns them back over, and it is the next player's turn. Play until all cards are matched. Player with the most matches wins.



3 X 0 =	О	ОХЗ=
ЗХВ	STEAL!	STEAL!
STEAL!	STEAL!	STEAL!

3 X 1 =	ЗХА	1 Х 3 =
Зхв	3÷3 =	1 ÷ 3A
STEAL!	STEAL!	STEAL!

3 X 2 =	<u>6</u> 3XA	6÷2 =
2 X 3 =	<u>6</u> 3XB	3
6÷3 = ⁺ ^{3A}	÷ 3A 2	STEAL!

3 X 3 =	9 3XA	9÷3 =
STEAL!	STEAL!	3 A
STEAL!	STEAL!	STEAL!

3 X 4 =	12 3XA	12 ÷ 4 =
4 X 3 =	12	3
12÷3 =	4 ÷ ЗА	STEAL!

3 X 5 =	15 3XA	15÷5=
5 Х 3 =	15	3 B
15 ÷ 3 =	÷ ЗА	STEAL!

3 X 6 =	18 3XA	18 ÷ 6 =
6 Х 3 =	18	З
18÷3 =	<u>6</u> ÷ 3A	STEAL!

3 X 7 =	21 3XA	21÷7 = ⁺³⁸
7 X 3 =	21 3XB	З
21÷3 A	7 ÷ ЗА	STEAL!

3 X 8 =	24 _{3XA}	24 ÷ 8 =
8 X 3 =	24	З
24÷3 A	8 ÷ ЗА	STEAL!

3 X 9 =	27 3XA	27÷9 = ⁺³ ⁸
9 Х 3 =	27 3XB	З
÷3A	<u>9</u> ÷ ЗА	STEAL!

3 X 10 =	30	30÷10 = ⁺³ ⁸
10 Х 3 =	3хв	÷ 3В
30÷3 =	10 ÷ 3A	STEAL!

