Success with MATH FACT FLUENCY

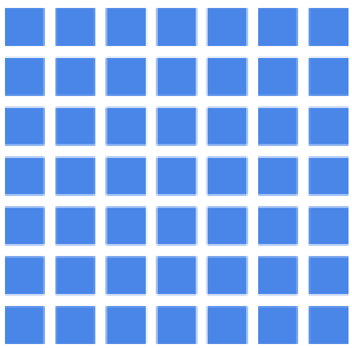
Teachers + Students + Families

When are Near Squares useful? What do they look like?

It works great for the tricky 6s facts. Also 8s and 9s. Have a look!

Near Squares: 6s, 7s, and 8s

Skylar was arranging polaroid photos on her wall. She wants to arrange them in 7 groups of 8. How many polaroid photos will she be able to fit?



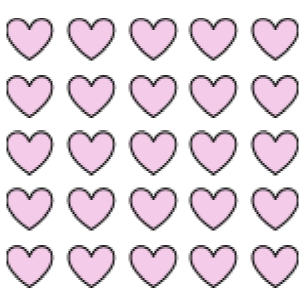
I know 7 groups of 7 is 49: 7 x 7 = 49

Near Squares
Now I can add one group of 7 to get 56 .

Students usually have an easier time memorizing their squares. Squares are very beneficial because they are close to some of the toughest multiplication facts (such as 7 × 8). Here, it is easier for students to add 7 to 49 since they know 7 × 7 rather than adding 7 groups of 8 (or 8 groups of 7) or skip counting.

Near Squares: Another Example

If your child knows the square of 5 (5 × 5=25), they can use this to solve their 6 facts. Have a look at a fact that is commonly difficult for students: 5 × 6 or 6 × 5.



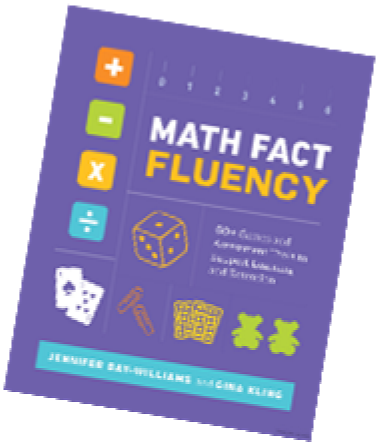
How could we use this to figure out 5 x 6?

Near Squares
Now I can add one group of 5 to get 35 .

Near Squares: Extending Near Squares

(see "fact #5" below)

Knowing squares and near squares can be helpful with solving problems with larger numbers mentally – *very useful*!
Examples:



12 × 13

12 × 12=144

144 + 12=

156

90 × 80

9 × 9= 81, *add two 0s for 90 x 90=8,100*

Subtract a group of 90 to get 8,100 - 90=

7,200

Thank you for your support in developing fact fluency with your child!

Multiplication Strategy Brief: *Near Squares*

Research-based *learning* facts:

1. Students start learning multiplication facts by skip counting. That is natural, but they must progress to more efficient reasoning strategies.
2. Implementing reasoning strategies may initially be slower than counting, but eventually it is faster and will lead to quick recall (automaticity), with the added (critical) benefit of long-term retention (rather than forgetting a fact and having to drop back to skip counting).
3. Visuals and stories help students to understand the reasoning strategy.
4. Mathematical reasoning emerges as children notice patterns and relationships through repeated opportunities. Playing purposeful math games is a great way to do this (see pages 3 and 4)!
5. Reasoning strategies themselves are important to learn because they generalize to larger numbers. Learning the strategies builds stronger math skills!

Games for *Near Squares* and Learning Facts

GAME: *Squares/Near Squares Bingo* (2+ players)

Materials:

- ✓ 5 x 5 blank grids/bingo boards for each player
- ✓ Bingo chips/counters (e.g., pennies/coins would work)
- ✓ Deck of playing cards 1-10 (ace =1, queen = 0)

How to play:

1. Before beginning the game, be sure to post a list of the square products: 0, 1, 4, 9, 16, 25, 36, 49, 64, 81, and 100.
2. Players copy these numbers into their games boards. Some numbers will be repeated and not all numbers need to be used.
3. Parent (or designated leader) draws a card from the deck. Players will square that number and cover their answer on their board.
4. Players cover one square at a time (only one chip can be placed and chips cannot be moved once they've been placed).
5. The first player to get five in a row (horizontally, vertically, or diagonally) wins.

Game: *Fixed Factor War* (Game 32, p. 88, *Math Fact Fluency*)(2 players)

Materials:

- Deck of cards, with Kings and Jacks removed. Queens = 0; Aces = 1.

How to Play:

1. Find a 6 in the deck and place it between the two players (or 7 or 8) face up. That number is the fixed factor.
2. Deal the rest of the cards equally, face down.
3. Each player takes a turn to flip over the top card of his/her pile of cards. The player must state the product of the "fixed" factor card and the card they flipped, and share how they know (see example below).
4. The player who correctly states the greater product in the round gets both players' cards. (The "middle" fixed factor card stays.)
5. If there is a tie, a "war" is declared, and players repeat the process, with the winner taking all played cards.
6. The player with the most cards wins when time is up.

More ways to play: Use different Fixed Factors (e.g., a 9). Play *Factor War* – No fixed factor, each player draws 2 cards. Play with addition, too! (*Fixed Addend War* or *Addend War*)

Fixed Factor Card:
does not change