BASIC FACTS OF INTEGRATING FACTS INTO DAILY INSTRUCTION

PROMOTING FACT MASTERY IN A BALANCED MATH CLASSROOM

COMPLETELY THE NUMBER GREETING AT YOUR TABLE. BE CREATIVE WITH YOUR STRATEGY! DO NOT SHARE YOUR STRATEGIES JUST YET!

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COMMON CORE MATH PRACTICES

COMMON CORE STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

MP.1
Make sense of problems & persevere solving them

MP.2
Reason abstractly & quantitatively

MP.3
Construct viable arguments & critique the reasoning of others

MP.4
Model with mathematics

MP.5
Use appropriate tools strategically

MP.6
Attend to precision

MP.7
Look for & make use of structure

MP.8
Look for & express regularity in repeated reasoning

WHAT ARE BASIC FACTS?

Facts with addends 0-10

Factors 0-10

Power of 10

WHAT DOES MASTERY LOOK LIKE? SOUND LIKE?

- ***NOT*** ROTE MEMORIZATION!
- SCHOLARS BEGIN TO APPLY STRATEGIES TAUGHT IN CLASSROOM
- MOVE TOWARDS UNDERSTANDING
- SHIFT IN COMMON CORE MATHEMATICS
- AUTOMATICITY & UNDERSTANDING
  - AUTOMATICITY – EFFORTLESSLY RECALL FACTS (FLUENCY
  - ABILITY TO RECALL IS CONNECTED TO UNDERSTANDING

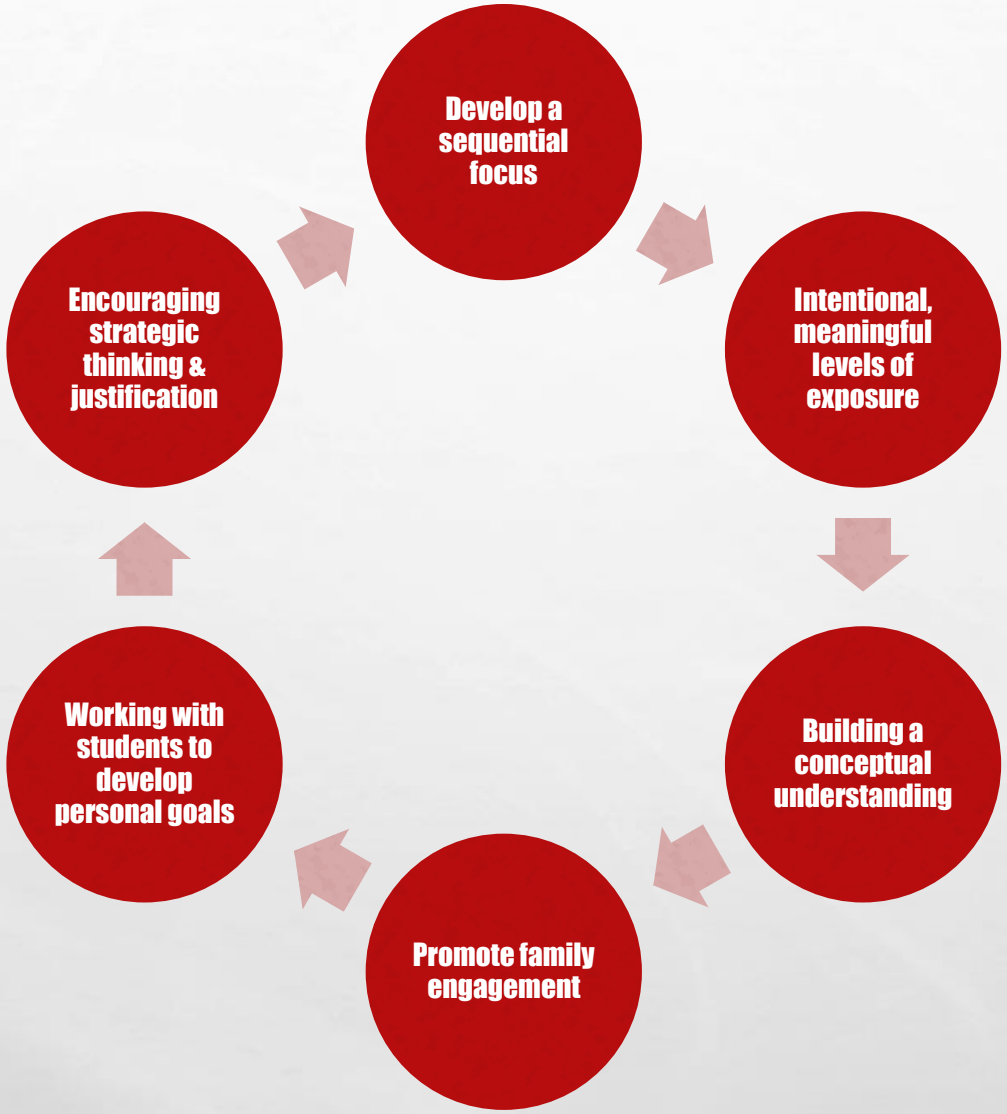
BIG IDEAS IN FACT MASTERY

ADDITION & SUBTRACTION

- THE SUM WHEN 1 IS ADDED TO A QUANTITY IS THE NEXT COUNTING NUMBER
- OUR NUMBER SYSTEM IS BASED ON PATTERNS
- ADDITION IS JOINING OR COMBINING PROCESS
- SUBTRACTION IS A SEPARATION OR COMPARISON PROCESS
- ORDER OF ADDENDS DOES NOT CHANGE THE SUM OR COMMUTATIVE PROPERTY
- ADDITION & SUBTRACTION ARE INVERSE PROCESSES

MULTIPLICATION & DIVISION

- NUMBERS CAN COUNT OBJECTS OR GROUPS
- NUMBER SYSTEMS IS A SYSTEM OF PATTERNS
- ORDER OF FACTORS DOESN'T CHANGE THE PRODUCT
- ADDITION & MULTIPLICATION ARE RELATED OPERATIONS
- MULTIPLICATION & DIVISION ARE INVERSE OPERATIONS
- NUMBERS ARE FLEXIBLE


Develop a sequential focus
Intentional, meaningful levels of exposure
Building a conceptual understanding
Promote family engagement
Working with students to develop personal goals
Encouraging strategic thinking & justification

OUR ROLE

Table Talk!

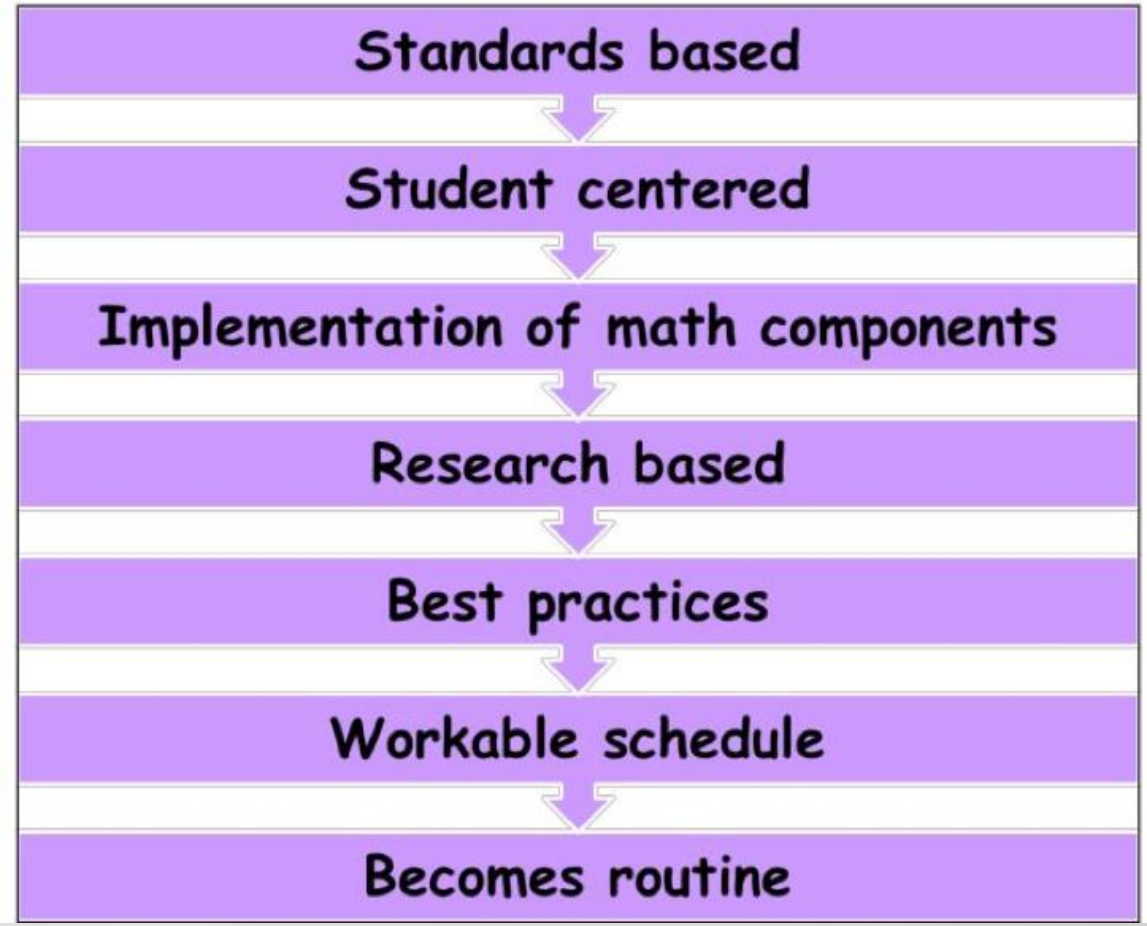
How might attention to the sequence in which facts are introduced support mastery of the facts?

First Grade Basic Fact Sequence

Foundation Facts	
+1/+2	Students build on their understanding of counting by exploring 1 or 2 more and 1 or 2 less.
+0	Using their knowledge of the concept of addition, students explore what happens when they add or subtract nothing from a quantity.
+10	Adding 10 to a single-digit number results in a 2-digit sum. Students explore adding 10 in order to build understanding and automaticity that will be needed later when exploring the using-ten strategy.
Doubles	Students explore the concept of doubling and what it means to add 2 groups of equal size.
Making Ten	Because 10 is foundational in our number system, students explore the different ways in which 2 addends result in a sum of 10. This knowledge becomes critical as they later explore using tens to find unknown facts.
Building on the Foundation	
Using tens	Now that students know combinations of addends that have a sum of 10, they use their understanding of the flexibility of numbers to find ways to break apart addends to create simpler facts by using tens (e.g., 9 + 7 is changed to 10 + 6).
Using doubles	Students' knowledge of doubles facts is now put to use to find unknown facts that are near-doubles (e.g., 4 + 5 might be thought of as 4 + 4 + 1).

COMPONENTS OF BALANCED MATH CLASSROOM

1. MATH REVIEW & MENTAL MATH
2. CONCEPTUAL UNDERSTANDING
   - INTERVENTION
   - ENRICHMENT
3. PROBLEM SOLVING
4. FACT MASTERY
5. ASSESSMENTS



1. NUMBER ROUTINES

- ROUTINES ARE A DESIRABLE WAY TO BEGIN MATH CLASS. THEY DEVELOP NUMBER SENSE BY CONNECTING CRITICAL MATH CONCEPTS ON A DAILY BASIS. THEY SHOULD BE USED IN PLACE OF A TRADITIONAL WARM-UP OR REVIEWING HOMEWORK.

NUMBER TALKS

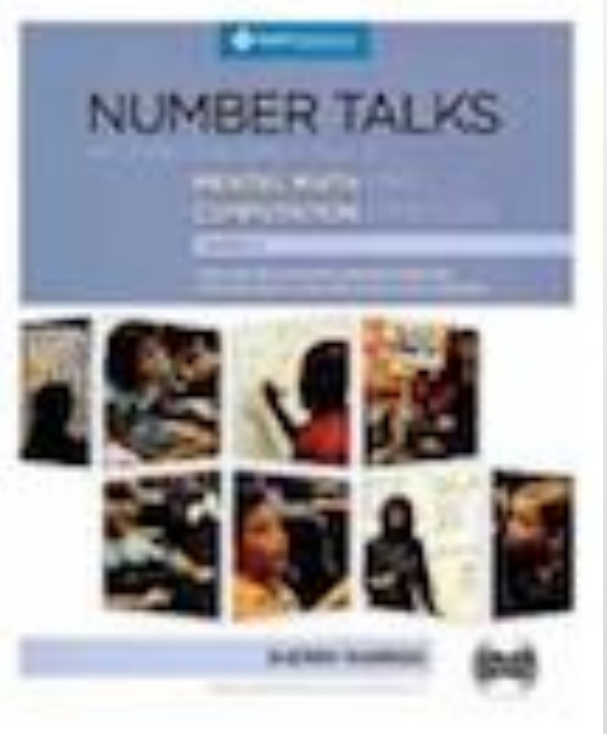
Table Talk!

Use what you observed to justify how mental math (NUMBER TALKS) can support fact mastery?

Key your responses to:

http://padlet.com/agiles3905/mentalmath

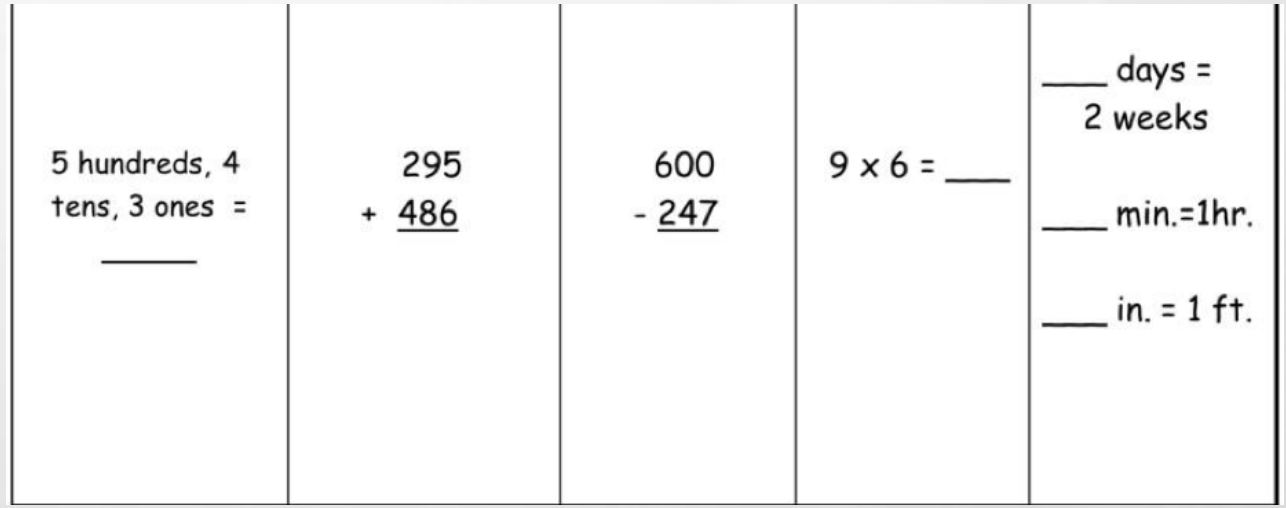
NUMBER TALKS CONT'D..



- STUDENTS SHARE THEIR STRATEGIES WITH PEERS
- SHARED AUTHORITY IN DETERMINING ACCURATE, MOST EFFICIENT STRATEGIES
- TEACHER IS THE ULTIMATE AUTHORITY
- WRONG ANSWERS ARE USED AS TEACHABLE MOMENTS

1. DAILY MATH REVIEWS

- REPRESENT SPECIFIC STANDARDS FOR THAT GRADE LEVEL
- PROVIDE PRACTICE IN SEVERAL MATH STANDARDS OR STRANDS
- MATCH THE CONCEPTUAL FOCUS OF THE CURRENT INSTRUCTION
- REINFORCE PRIOR LEARNING & RETENTION OF PREVIOUSLY TAUGHT CONCEPTS & SKILLS
- PROVIDE DAILY PRACTICE FOR THE COMPUTATION SECTIONS ON DISTRICT & STATE ASSESSMENTS

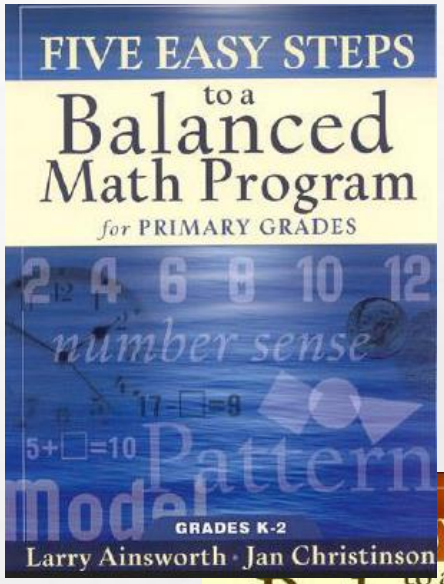


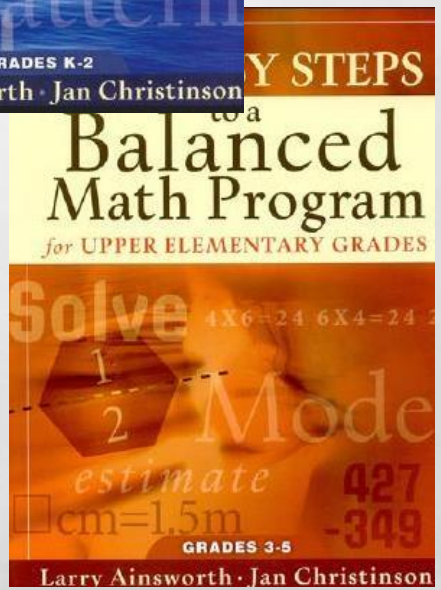
MENTAL MATH COMPONENT

- COMPUTATIONAL WORKOUT FOR THE BRAIN
- PROVIDES MENTAL PRACTICE IN COMPUTING BASIC NUMBER FACTS & COMBINING MATHEMATICAL OPERATIONS
- FOLLOWS A PARTICULAR CONCEPT OR THEME & DICTATES A STRING OF NUMBERS/OPERATIONS
- 3 PROBLEMS/5 MINUTES

COMMON THEMES

- NUMBER FACTS
- COMBINING OPERATIONS
- MULTIPLYING BY 10, 100, 1000
- NUMBER PROPERTIES
- MATH VOCABULARY
- FRACTIONAL PARTS
- SKIP COUNTING
- PERCENT OF A WHOLE
- FRACTION-DECIMAL-PERCENT EQUIVALENCY
- MEASUREMENT CONCEPTS



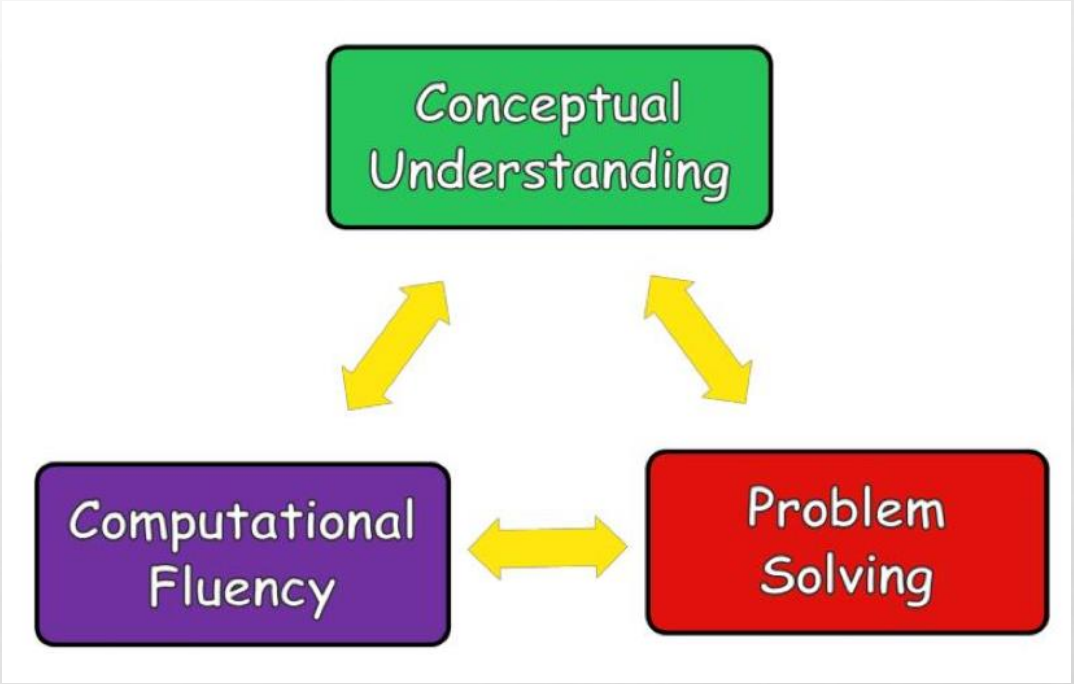


2. CONCEPTUAL UNDERSTANDING

"... Consists of logical relationships constructed internally and existing in the mind as a network of ideas...by it's very nature, conceptual knowledge is knowledge that is understood."

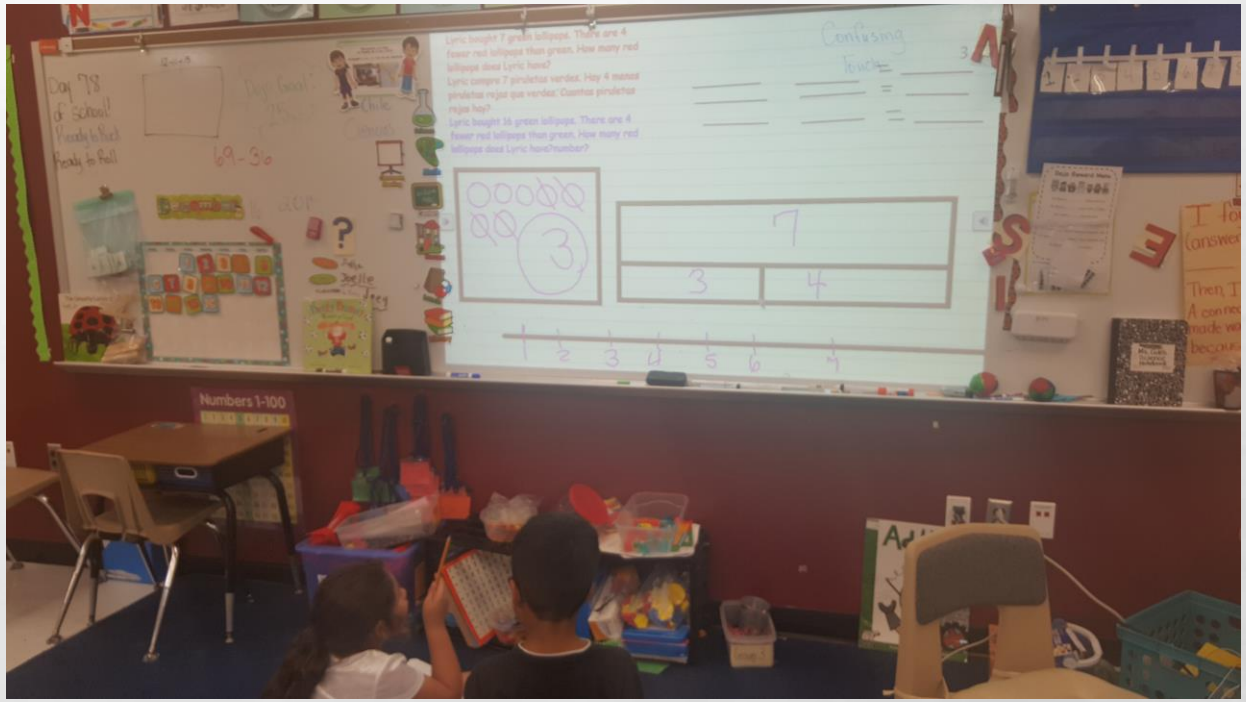
Table Talk!

- WHAT IS CONCEPTUAL UNDERSTANDING? WHY IS IT IMPORTANT IN MATHEMATICS?
- HOW IS CONCEPTUAL UNDERSTANDING DIFFERENT THAN PROCEDURAL UNDERSTANDING?



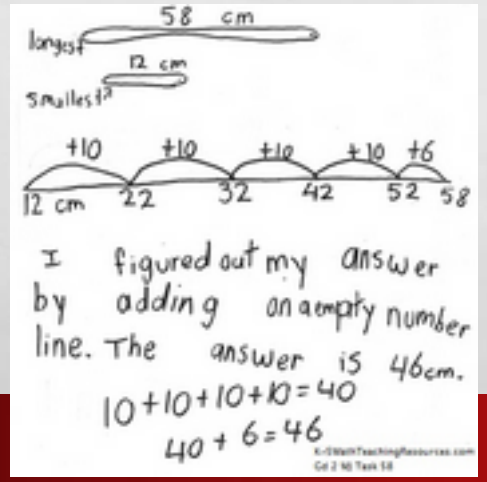
3. PROBLEM SOLVING

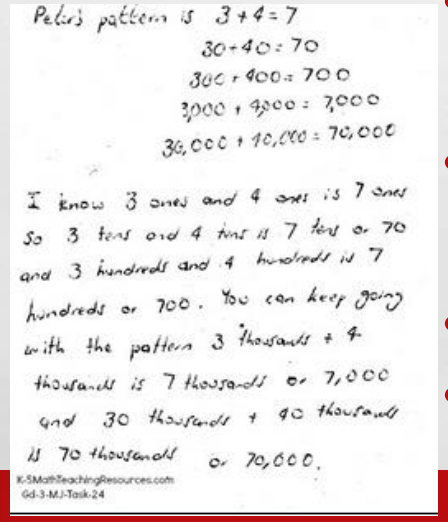
- DAILY
- DIFFERENTIATION
- TEACHER MODELING→ STUDENT MONITORING →STRATEGY SHARE
- INCORPORATES ACCOUNTABLE TALK & INCORPORATING STRATEGIES
- ABLE TO INCORPORATE BASIC FACTS
- WRITING COMPONENT
- PROGRESS MONITORING & BENCHMARK ASSESSMENT



DAILY JOURNALING

- RECORD SOLUTIONS, STRATEGY, & PROCESSES
- WRITE ABOUT LEARNING: AT TIMES STUDENTS MAY BE ASKED TO REFLECT ON THEIR MATH LEARNING.





CHARACTERISTICS OF A GOOD MATH JOURNAL QUESTION

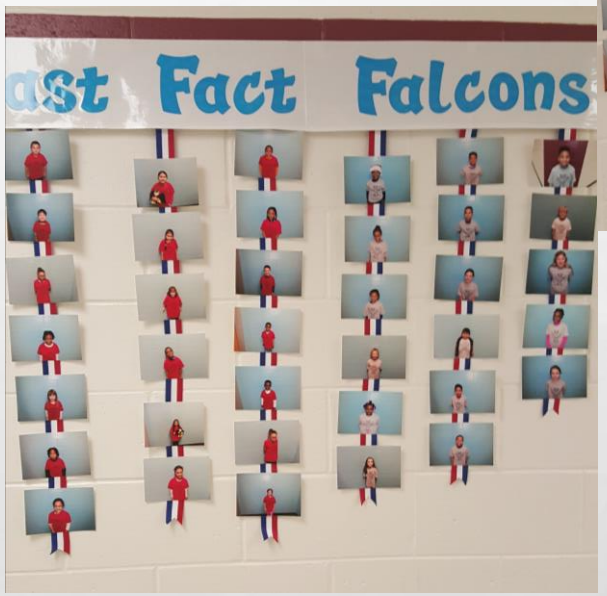
- BUILDS IN DIFFERENTIATION BY ALLOWING FOR MULTIPLE ENTRY POINTS AND RECORDING TECHNIQUES, THEREBY ALLOWING ALL STUDENTS TO WORK AT THEIR INDIVIDUAL LEVEL OF THINKING,
- PROVIDES THE OPPORTUNITY FOR STUDENTS TO LEARN BY ANSWERING THE QUESTION, AND THE TEACHER TO LEARN ABOUT EACH STUDENT FROM THE ATTEMPT,
- MAY HAVE MORE THAN ONE SOLUTION OR A VARIETY OF POSSIBLE SOLUTION PATHS THAT RANGE FROM SIMPLE TO COMPLEX,
- REQUIRES MORE THAN JUST REMEMBERING A FACT OR REPRODUCING A SKILL,
- PROVIDES OPPORTUNITIES FOR STUDENTS TO REPRESENT THEIR MATHEMATICAL IDEAS USING MODELS AND WRITTEN LANGUAGE,
- PROVIDES OPPORTUNITIES FOR STUDENTS TO JUSTIFY THEIR REASONING AND EVALUATE THE REASONING OF OTHERS,
- HAS CLEAR, CONCISE DIRECTIONS,
- PROVIDES OPPORTUNITIES FOR GROUP WORK AND DISCUSSION.

PROBLEM SOLVING TASK

1. TEACHER & STUDENTS READ PROBLEM TOGETHER. TEACHER CHECKS FOR UNDERSTANDING.
2. STUDENTS TAKE 5-10 MINUTES TO SOLVE PROBLEM INDEPENDENTLY
3. STUDENTS SHARE POSSIBLE STRATEGIES WITHIN GROUP. GROUP RECORDS MOST EFFECTIVE STRATEGY.
4. SMALLER GROUPS SHARE IN WHOLE GROUP SETTING TO IDENTIFY MOST EFFICIENT STRATEGY.
5. WHOLE GROUP DISCUSSES STEPS AND DEVELOPS A WRITTEN EXPLANATION

4. ASSESSING FACTS

- Big Ideas
- Conceptual Understanding
- Building Automaticity: Targeted Practice & Progress Monitoring
- Connecting to Subtraction

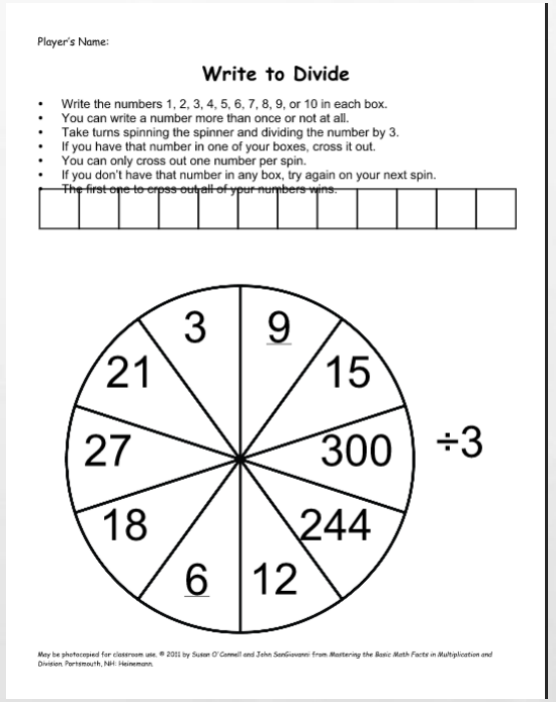


HOME CONNECTION

Table Talk!

Share your best/most efficient practices to promoting family engagement.

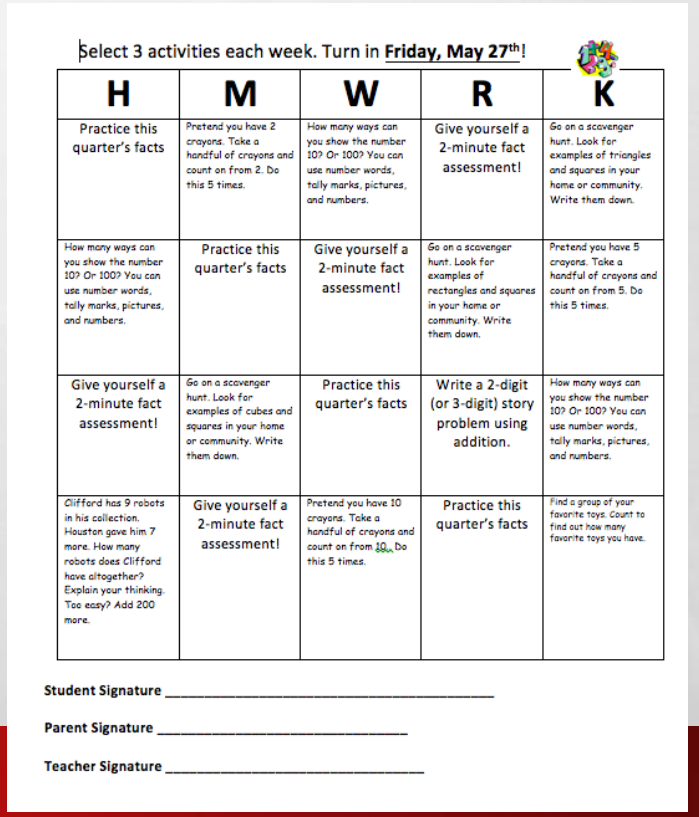
- FAMILY FACT NIGHT
- SEND HOME GAMES FOR INTENTIONAL HOMEWORK TASKS!!
- INCENTIVES FOR STUDENT/PARENT ENGAGEMENT
- DATA POINTS (I.E. REPORT CARDS, PARENT CONFERENCES)



Player's Name:

Write to Divide

- Write the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 in each box.
- You can write a number more than once or not at all.
- Take turns spinning the spinner and dividing the number by 3.
- If you have that number in one of your boxes, cross it out.
- You can only cross out one number per spin.
- If you don't have that number in any box, try again on your next spin.
- The first one to cross out all of your numbers wins.



Select 3 activities each week. Turn in **Friday, May 27th**!

H	M	W	R	K
Practice this quarter's facts	Pretend you have 2 crayons. Take a handful of crayons and count on from 2. Do this 5 times.	How many ways can you show the number 10? Or 100? You can use number words, tally marks, pictures, and numbers.	Give yourself a 2-minute fact assessment!	Go on a scavenger hunt. Look for examples of triangles and squares in your home or community. Write them down.
How many ways can you show the number 10? Or 100? You can use number words, tally marks, pictures, and numbers.	Practice this quarter's facts	Give yourself a 2-minute fact assessment!	Go on a scavenger hunt. Look for examples of rectangles and squares in your home or community. Write them down.	Pretend you have 5 crayons. Take a handful of crayons and count on from 5. Do this 5 times.
Give yourself a 2-minute fact assessment!	Go on a scavenger hunt. Look for examples of cubes and squares in your home or community. Write them down.	Practice this quarter's facts	Write a 2-digit (or 3-digit) story problem using addition.	How many ways can you show the number 10? Or 100? You can use number words, tally marks, pictures, and numbers.
Clifford has 9 robots in his collection. Houston gave him 7 more. How many robots does Clifford have altogether? Explain your thinking. Too easy? Add 200 more.	Give yourself a 2-minute fact assessment!	Pretend you have 10 crayons. Take a handful of crayons and count on from 10. Do this 5 times.	Practice this quarter's facts	Find a group of your favorite toys. Count to find out how many favorite toys you have.

Student Signature _____

Parent Signature _____

Teacher Signature _____

REFERENCES

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