Resources for Supporting Operational Fluency

with whole numbers

When helping students become fluent in their operations, it is important that our introduction to early math facts is centered on number sense and conceptual understanding *first,* before supporting students to be efficient, flexible and accurate. Utilizing games and activities in your classroom is one way to support this idea. Below, we have compiled a list of resources for each of the four operations to support building fluency once visual models and relationships to conceptual understanding have been established.

Addition

Resources:

Snap 10
Go Fish to 10
Small Double Bingo
Erase
Doubles Bingo

Videos:

Snap 10 (2:50)
Go Fish to 10 (2:35)

Subtraction

Videos:

Bullseye with Dice (2:00)
Don't Break the Ice (7:29)

Resources:

Subtraction Stacks
Around the House
Salute
Hide the cubes
Minus One
Subtract from 10

Resources for all four

Softball Hits

Teacher
Student

Three Dice Take

Teacher
Student

Multiplication

Resources:

Four's a Winner
Mini Multo
Squares Bingo
Multiplication Array Bingo
Strive to Derive
Rectangle Fit

Videos

Four's a Winner (2:22)
Multiplication Array Bingo (3:18)

Division

Videos:

Factoring Game (2:53)

Resources:

Factoring Game - 8
KCM The Factor Game
Division Spin

Resources and Videos from:

Math Recovery
KCM Kentucky Center for Mathematics
K5 Math

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Math for Teachers by Mount Holyoke College
mathleadership.org

Tips for Supporting Operational Fluency

Be intentional.

Remove the chance from games.

Games with dice or decks of cards are engaging and great ways for students to practice fluency and we want to use them strategically. Consider creating your own dice with blank cubes so you can choose the numbers they will roll. Creating a set of cards rather than using the standard deck of cards is a way to be more intentional with the math you want students to engage with.

Scaffold fact fluency with purposeful sequencing.

Know what comes before.

When thinking about operational fluency in grades 2 and up, begin by asking yourself - "What skills comes before this?" For example, when teaching strategies for addition and subtraction there are prerequisite combinations and partitions students should develop first such as: **partitions of 5, small doubles, five plus, partitions of 10 and partitions of 6-9.**

Recommended sequencing.

When supporting students with operational fluency you can utilize a sequenced order of facts, once visual models and relationships to conceptual understanding have been established. This will support students in utilizing what they know to strategize and connect with newer and more challenging facts. There are several sequences you can use. We recommend the following for multiplication and division from Robert J. Wright & David Ellemor-Collins, 2018.

Recommended Sequence for Multiplication and Division *Robert J Wright & David Ellemor-Collins, 2018*	
Range 1: 2's and 10's **Range 2:** Low x low (3-5's) **Range 3:** Low x high (3-5's x 6-9's)	**Range 4:** High x High (6-9's) **Range 5:** Factors >10

Further Your Learning

- **Multiplication: The Case of Ibby (50 minutes)**
- **Stuck in the World of Repeated Addition and Subtraction (45 minutes)**
- **Figuring out Fluency in Mathematics: K-8**
- **The Learning Framework in Number by Wright, Ellemor-Collins**
- **Kentucky Center for Mathematics**