

A Case Study: Using Addition Running Records to Support Fluency in Grade 2 Classrooms

Defining Fluency, Understanding the Assessment Tool,
Analyzing Data, & Grouping Students

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Fluency

A consistent, shared definition for fluency can advance students more quickly than with previous methods

Historically...

- Lack of shared definition
- Speed is overvalued
- Use of timed tests and Xtra Math
- No way to assess fluency
- Teacher frustration with students lack of math fact knowledge

The way forward...

- Strategies
- Flexibility
- Accuracy
- Efficiency

Strategies

“How can you use the doubles +1 strategy to solve $7+8$?”

- Develop conceptual understanding of the operation
- Practice with concrete manipulatives leads to students finding patterns & developing strategies
- Internalizing a strategy requires varied practice

Flexibility

“How did you figure out the answer?”

- Using more than one approach
- Using knowledge of number relationships to solve unknown problems
- Breaking apart numbers in multiple ways

Accuracy

Was the student correct?

- Produces the correct answer
- Thinks about the reasonableness of an answer
- Easily and quickly carries out a procedure

Efficiency

How long did it take the student to answer?

- Knowing “by memory”
- Recall without having to think about it
- Rule of thumb 3-4 seconds

Memorization vs. From Memory

“I want my students to memorize their facts.”

- The CCSS require 2 standards to be known “by memory”
- Graham Fletcher explains that:
 - knowing something by memory leverages strategy use
 - memorization is void of strategy

Meaningful Practice

Developing fluency is a marathon, not a sprint.

- Practice should be purposeful
- Focus on developing thinking strategies
- Leverage knowledge of number relationships

Data Collection

Understanding the Assessment Tool

Analyzing the Data

Grouping Students

Mathematical Running Records

“...like a GPS for Basic Fact Fluency: they tell you where you are and how to get to where you want to go!”

- Developed by Dr. Nicki Newton
- 1:1 interview with student, modeled after reading running records
- Determine which facts the student has stored in memory and which strategies if any are used

Running Record Assessment Tool

Addition Running Record Recording Sheet

Part 1	Codes (What do you notice?)	
0 + 1 a 5s pth	fca fco cah coh dk ic wo sc asc	A0—add 0
2 + 1 a 5s pth	fca fco cah coh dk ic wo sc asc	A1—add 1
3 + 2 a 5s pth	fca fco cah coh dk ic wo sc asc	Aw5—add w/in 5
2 + 6 a 5s pth	fca fco cah coh dk ic wo sc asc	Aw10—add w/in 10
4 + 6 a 5s pth	fca fco cah coh dk ic wo sc asc	AM10— add making 10
10 + 4 a 5s pth	fca fco cah coh dk ic wo sc asc	A10 add 10 to a #
7 + 7 a 5s pth	fca fco cah coh dk ic wo sc asc	AD—add doubles
5 + 6 a 5s pth	fca fco cah coh dk ic wo sc asc	AD1 –add dbls +/- 1
7 + 5 a 5s pth	fca fco cah coh dk ic wo sc asc	AD2—add dbls +/- 2
9 + 6 a 5s pth	fca fco cah coh dk ic wo sc asc	AHF/C9 add higher facts/use compensation w/9
8 + 4 a 5s pth	fca fco cah coh dk ic wo sc asc	AHF/C 7/8 add higher facts/ use compensation with 7/8
7 + 8 a 5s pth	fca fco cah coh dk ic wo sc asc	AHF/C7/8 add higher facts/use compensation with 7/8
<p>Codes: a— automatic 5s - 5 seconds pth - prolonged thinking time</p>		
<p>fca—finger counted all fco—finger counted on cah - counted all in head coh—counted on in head dk - didn't know ic—in context (could tell when set in a story)</p>		
<p>wo—wrong operation sc— self-corrected asc - attempted to self-correct</p>		

October

Small Group Targeted Instruction

Facts w/in Five	Facts w/in 10	Friends of 10	Doubles	Doubles +/-	Compensation	Fluent
	Julia	Luna	John	Scarlett	Layla	Mary
	Luna	Bailey	Brody	Eamon	Evelyn	Kaden
	Mabel		Ashley	Ian		Elizabeth
	Parker		Ian	Jayden		Logan
	Evan					Kevin
	Hailey					
	Bailey					

January

		facts within 10				friends of ten	teen	doubles				compensation		
Student	0	1	w/in 5 3+2	w/in 10 2+6	w/in 10 3+4	sum 10 6+4	add 10 10 +4	D<10 4+4	D>10 8+8	D +1 5+6	D + 2 7+5	AHF/9 9+6	AHF/8 8+4	AHF 7+8
A	A	5s	pth/coh	pth/coh	mixed	A	A	A	mixed	5s	dk	5s	dk/fco	dk
A	A	A	coh	coh	A	A	A	A	A	A	fco	fco	fco	fco
A	A	A	pth/coh	A	pth	A	A	A	A	5s	pth	pth/make 10	pth/sc	pth/d+1
A	A	A	A	A	A	A	A	A	A	A	dk	A	pth	pth
A	A	A	coh	dk/"6"	A	A	A	A	mixed	A/sc	dk	5s	dk	fco
A	A	A	A	A	A	A	A	A	A	A	pth/fco	A	A	A
A	A	fca	cah	fca	dk	5s	fca	dk	dk	dk	dk	dk	dk	dk
A	A	A	A	5s	A	A	A	A	A	dk	dk	dk	dk	dk
A	A	5s	5s	A	A	A	A	A	mixed	coh	pth	pth	pth	pth
A	A	A	A	A	A	A	A	A	A	A	5s	pth	dk	dk
A	A	5s	A	pth/coh	fco	A	A	A	dk	pth/fco	pth/fco	pth/fco	dk	pth/fco
A	A	A	A	A	A	A	A	A	dk	A	pth/fco	pth/fco	pth/comp	pth/count back
A	A	A	A	A	A	A	A	A	A	A	pth/fco	pth/fco	5s	pth
A	A	A	A	A	A	A	A	A	A	A	dk	A	pth/make 10	A
A	A	A	A	A	A	A	A	A	A	A/d+1	5s	5s/coh	pth	pth/fco
A	A	A	A	A	A	A	A	A	A	A	A	A	5s	5s
A	A	A	A	5s	A	A	A	A	mixed	A	pth/fco	pth/fco	A	A
A	A	A	A	A	A	A	A	A	A	A	5s	5s/make 10	A	A
A	A	A	A	sc	A	A	A	A	A	pth	5s	pth	5s	pth/fco
A	A	A	A	A	A	A	A	A	A	A	A	A	fco	fco
A	A	A	5s/sc	pth	A	A	A	A	mixed	5s/fco	5s/sc	pth/fco	pth/fco	dk/fco
A	A	A	A	A	A	A	A	A	A	5s/fco	pth/fco	A	5s	pth

January

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				Mabel	Layla	Kaden
				Parker	Scarlett	Elizabeth
				Evelyn	John	Logan
				Ashley		Kevin
				Hailey		Brody
				Nicholas		Eamon
						Ian
						Jayden

Yearlong Data Results

Month Running Records was Given	Number of Students Fluent
October	5/21 (24%)
January	9/22 (41%)
June	15/22 (68%)