

Instructional Settings and the use of Resources that go with the Purple & White Books

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US MATH RECOVERY COUNCIL® NATIONAL CONFERENCE

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<https://www.plickers.com/library/5bce513c3bf8110004fb2e52>

White Book Website

<https://study.sagepub.com/wrightLFIN>



Education Instructor Resources Help

Login

Online Resources for Education



Primary Education

Cooper & Elton-Chalcraft:
Professional Studies in Primary
Education, 3e

Lawrence: Teaching Primary
Physical Education, 2e

Wright & Ellemor-Collins: The
Learning Framework in Number



Wright & Ellemor-Collins: The Learning Framework in Number

The online resources for *The Learning Framework in Number* include:

- The downloadable LFIN Assessment Kit, including printable resources necessary for carrying out the assessments detailed in the book
- The downloadable LFIN Teaching Kit, including printable resources for use in classroom teaching

[LFIN Assessment Kit](#)



[LFIN Teaching Kit](#)



What makes up an instructional setting?



Instructional Setting

“Setting – a situation used by the teacher when posing arithmetical tasks.

Settings can be:

- (a) materials (e.g. numeral track, ten-frame, counters),
- (b) informal written,
- (c) formal written, or
- (d) verbal”

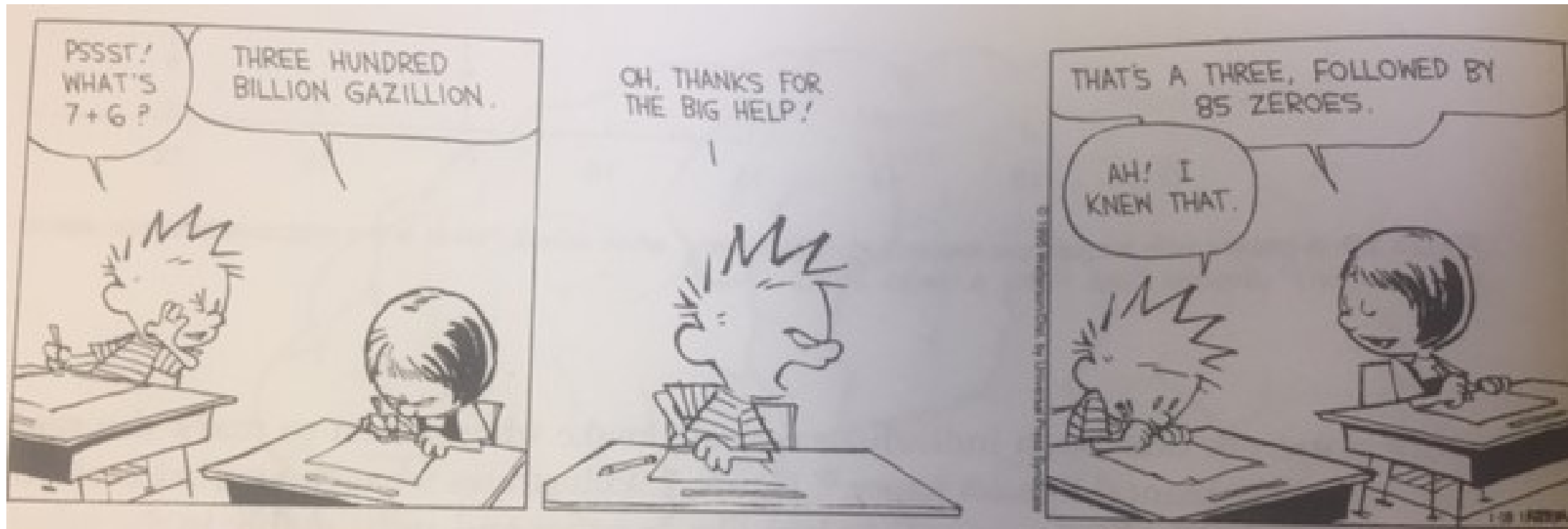
Distance the Setting

“We (Math Recovery) advocates an explicit instructional agenda to progress from:

- (a) the student seeing the materials, to
- (b) the teacher flashing the materials, to
- (c) the student seeing the materials only after they have responded to a task, perhaps to check their response, to
- (d) posing tasks in a verbal or written form where no materials are available.”

Teaching Number in the Classroom with 4-8 year Olds. Wright et al., 2nd edn 2012 (p.9)

You know when students do not have Structuring Numbers



What Makes Structuring Numbers Difficult?

“The model for Structuring Numbers 1 to 20 is more elaborate than the FNWS, BNWS and Numeral Identification models because progression across the levels involves interweaving of progression in four dimensions of mathematization – range, setting, complexity, and orientation.”

The Learning Framework in Number. Wright, R.J. and Ellemor-Collins, D., 2018 (p. 75)

Teaching Chart 2B: Early Structuring (p. 111)

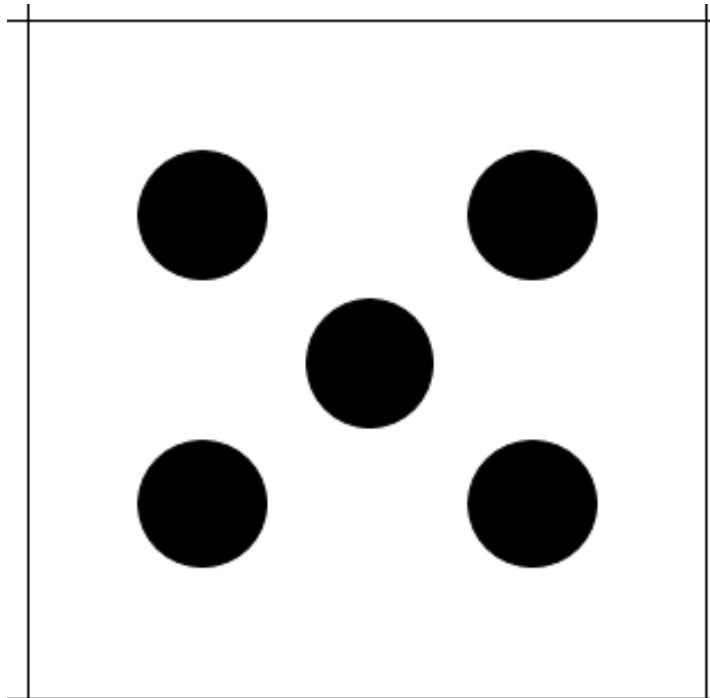
Topic	Teaching Procedures				Green Book
	1	2	3	4	
281 Spatial configurations	<i>Regular & irregular configurations</i> <i>Ascribe numerosity</i>	<i>Regular configurations</i> <i>Make spatio-motor patterns to match</i>	<i>Regular configurations</i> <i>Make auditory patterns to match</i>	—	5.4
282 Finger patterns 1 to 5	<i>Fingers seen</i> <i>Raise fingers sequentially</i>	<i>Fingers unseen</i> <i>Raise fingers sequentially</i>	<i>Fingers seen</i> <i>Raise fingers simultaneously</i>	<i>Fingers unseen</i> <i>Raise fingers simultaneously</i>	5.5.1, 5.5.2 5.5.3, 5.5.4
283 Finger patterns Double 1 to double 5	—	—	<i>Fingers seen</i> <i>Raise fingers simultaneously</i>	<i>Fingers unseen</i> <i>Raise fingers simultaneously</i>	5.5.5
284 Finger patterns Fingers keeping track	<i>Temporal sequences of sounds</i> <i>Use fingers to keep track</i>	<i>Temporal sequences of movements</i> <i>Use fingers to keep track</i>	—	—	5.5.6, 5.5.7
285 Finger patterns Five-plus patterns for 6 to 10	<i>Fingers seen</i> <i>Make finger patterns</i>	<i>Fingers unseen</i> <i>Make finger patterns</i>	—	—	6.5.1
286 Finger patterns Doubles-plus-one patterns	<i>Fingers seen</i> <i>Make doubles-plus-one in two movements</i>	<i>Fingers unseen</i> <i>Make doubles-plus-one in two movements</i>	<i>Fingers seen</i> <i>Make doubles-plus-one in one movement</i>	<i>Fingers unseen</i> <i>Make doubles-plus-one in one movement</i>	6.5.2
287 Finger patterns Partitions of 10 fingers	<i>Make partitions of 10</i>	<i>Make partitions systematically in sequence</i>	<i>Make partitions systematically in commuted pairs</i>	<i>Record partitions systematically</i>	6.5.4

Early Structuring

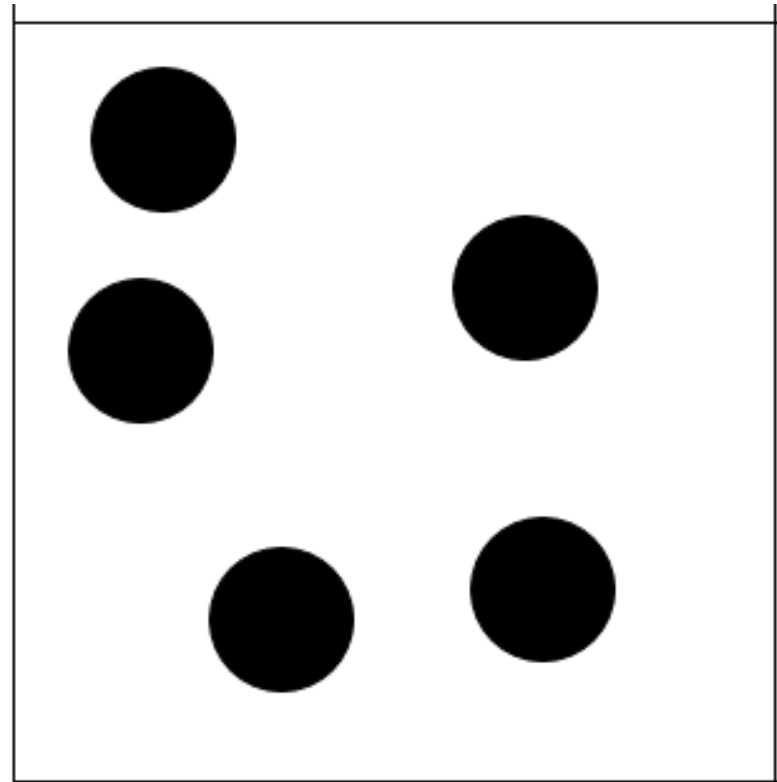
Spatial Configurations

- Regular and irregular dot patterns
- Finger patterns 1 to 5 & Double 1 to double 5
- Use of fingers to keep track of temporal sequences of sounds and movements
- Finger patterns five-plus to 10
- Finger patterns Doubles-plus-one
- Partitions of 10 fingers

How many do you see?











How many do you see?



2B-3B Structuring Numbers

Downloadable resources:

-  LFIN dot configurations cards
-  LFIN facts-additions
-  LFIN facts-subtractions
-  LFIN five frames-partitions of 5
-  LFIN five frames-regular
-  LFIN ten frames-combinations
-  LFIN ten frames-partitions of 10
-  LFIN ten frames-regular

<https://study.sagepub.com/education/primary-education/wright-ellemor-collins-the-learning-framework-in-number>

LFIN Teaching Kit in White Book

At the
tables

2B / 3B	Early Structuring / Structuring Numbers 1 to 20
Dot cards	Dice and pairs patterns for 1–6.
Five frame sets:	
Regular 0–5	6 cards. Black dots.
Partitions of 5	6 cards. Black & orange dots.
Ten-frame sets:	
Regular 0–10	22 cards: 11 five-wise, 11 pair-wise. Black dots.
Partitions of 10	16 cards: 11 five-wise, 5 evens pair-wise. Black & orange dots.
Combinations	36 cards: All combinations of 0–5 with 0–5. Red & blue dots.
Arithmetic rack	
Addition facts	120 cards: 25 (Range 1), 20 (Range 2), 55 (Range 3), 20 (totals).
Subtraction facts	120 cards: 25 (Range 1), 20 (Range 2), 55 (Range 3), 20 (totals).

Key Elements of Intensive 1-to-1 Instruction related to Settings

Introduce the setting letting students examine the materials

Refer to the unseen setting refer to setting that has been distanced

Linking settings an arithmetical problem from two or more perspectives

Three techniques for presenting tasks in material settings. **Colour-Coding, Screening and flashing**

Turn to p. 111 and examine Teaching Chart 3B₁₀: Structuring on p. 116

What changes from the top to the bottom of this table?

Describe the changes as you go across each row in this table.

What materials are used as part of the teaching procedures?

Read the commentary on Teaching Chart 3B10 on pp. 118– 119.

Addition Facts Range 1 & 2

Range 1 Parts ≤ 5	$1+1$	$2+1$	$3+1$
	$1+2$	$2+2$	$3+2$
	$1+3$	$2+3$	$3+3$
	$1+4$	$2+4$	$3+4$
	$1+5$	$2+5$	$3+5$

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$4+1$	$5+1$
$4+2$	$5+2$
$4+3$	$5+3$
$4+4$	$5+4$
$4+5$	$5+5$

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Range 2 Whole ≤ 10

$1+6$	$2+6$	$3+6$	$4+6$
$1+7$	$2+7$	$3+7$	$6+1$
$1+8$	$2+8$	$7+1$	$6+2$
$1+9$	$8+1$	$7+2$	$6+3$
$9+1$	$8+2$	$7+3$	$6+4$

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$4+7$	$5+6$	$6+5$	$7+4$
$4+8$	$5+7$	$6+6$	$7+5$
$4+9$	$5+8$	$6+7$	$7+6$
$4+10$	$5+9$	$6+8$	$7+7$
$6+10$	$5+10$	$6+9$	$7+8$

What if they are still at Calvin's level of understanding of structuring?



Resources online supporting the Purple Book

Teaching Number in the Classroom with 4-8 Year olds

by Robert J Wright , Garry Stanger , Ann K. Stafford and James Martland

Student Resources

- 3. Number Words and Numerals >
- 4. Early Counting and Addition >
- 5. Structuring Numbers 1 to 10 >
- 6. Advanced Counting, Addition and Subtraction >
- 7. Structuring Numbers 1 to 20 >
- 8. Two-digit Addition and Subtraction: Jump Strategies >
- 9. Two-digit Addition and Subtraction: Split Strategies >
- 10. Early Multiplication and Division >



Teaching Number in the Classroom with 4-8 Year olds

Welcome to the companion website for the 2nd edition of *Teaching Number in the Classroom with 4-8 year olds*.

Here you'll find a wide range of exciting additional resources, including:

- Downloadable **extra chapter resources** including print-out grids, worksheets, cards and much more
- Extra tips on the most effective ways of working - read the **Facilitator's Guide**
- **Video demonstrations** of the instructional activities to help you get started - **watch** IA4.12 Rhythmic Patterns below:

Structuring Numbers 1-20 Activity

→ Clear the Board sheet.pdf

Double and near double cards.pdf

Double Decker Bus worksheet.pdf

Double Decker Bus.pdf

Double ten-frame blank cards.pdf

→ Double ten-frame worksheet.pdf

Five and Ten game sheet.pdf

Ten-wise cards (11-20).pdf

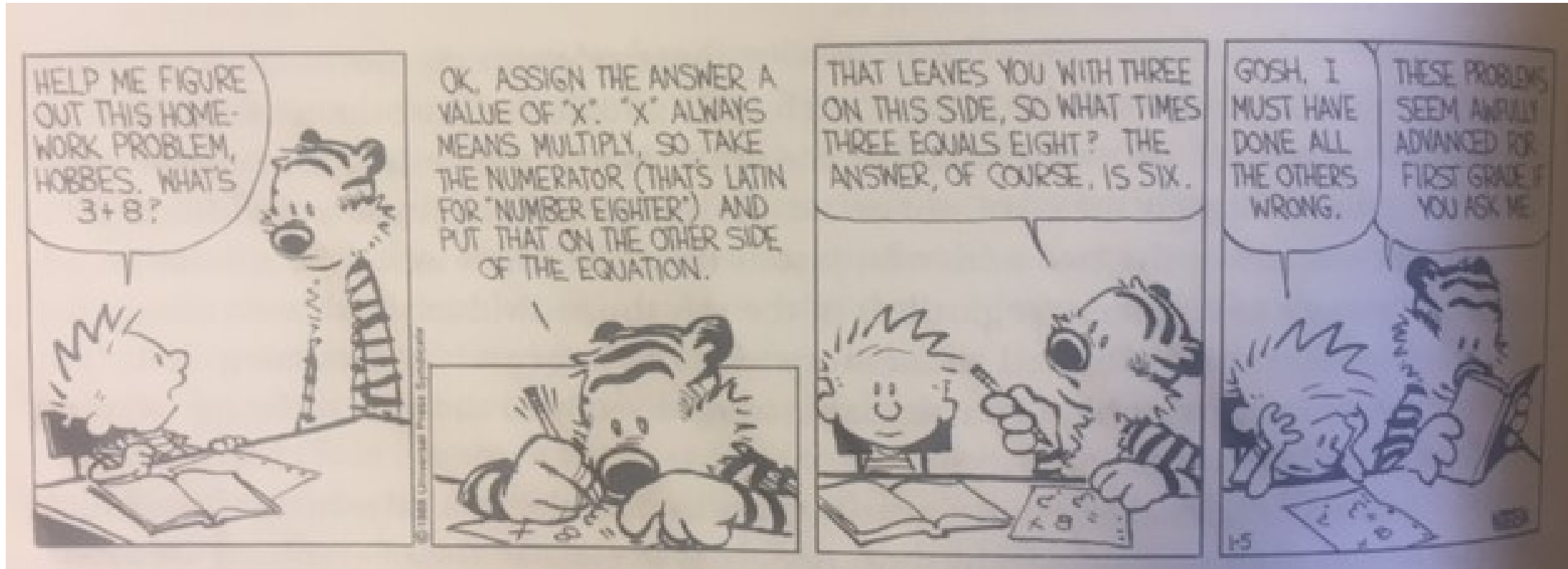
<https://study.sagepub.com/wrighttnc>

Demonstration of Clear the Board

2	3	4	5	6	7	8	9	10	11	12

<https://study.sagepub.com/wrighttnc/student-resources/7-structuring-numbers-1-to-2-0>

Going Beyond 10



Making Combinations to Twenty Fish

Purple Book IA 7.4

Double ten-frame worksheet

Name: _____

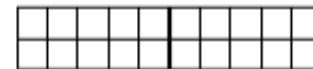
Draw these:



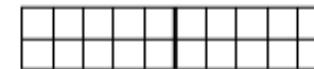
15



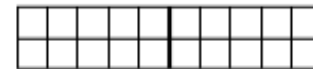
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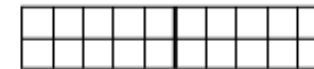
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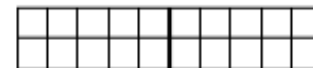
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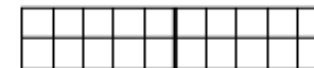
13



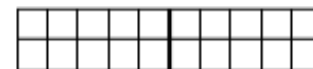
17



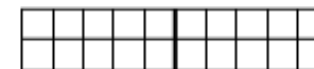
18



20



14



11

<https://study.sagepub.com/wrightnc/student-resources/7-structuring-numbers-1-to-2-1>

Bridges Apps

Free Math Apps

These apps are based on the visual models featured in *Bridges in Mathematics*. All apps are available in two or more versions: a web app for all modern browsers, and downloadable versions for specific operating systems and devices (such as Apple iOS for iPad).



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Fractions

The Fractions app lets students use a bar or circle to represent, compare, and perform operations with fractions with denominators from 1 to 100. Choose the fraction model and number of equal parts. Use a color to select specific parts to show a fraction of the whole.



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Geoboard

The Geoboard app is a tool for exploring a variety of mathematical topics introduced in the elementary and middle grades. Learners stretch bands around the pegs to form line segments and polygons and make discoveries about perimeter, area, angles, congruence, fractions, and more.



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Math Vocabulary Cards

Math Vocabulary Cards help students deepen their conceptual understanding of key terms in mathematics. Each card features three sections: a math term, a representative example or model, and a concise definition.



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Money Pieces

Money Pieces help students visualize and understand money values and relationships. Two versions of coins and bills are provided: virtual currency pieces that replicate the appearance and relative size of U.S. coins and the dollar bill, and area money pieces.



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Number Frames

Number Frames help students structure numbers to 5, 10, 20, and 100. Students use the frames to count, represent, compare, and compute with numbers in a particular range.



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Number Line

Number Line helps students visualize number sequences and illustrate strategies for counting, comparing, adding, subtracting, multiplying, and dividing. Choose number lines labelled with whole numbers, fractions, decimals, or negative numbers.



[Open Web App](#)
[Apple App Store](#)
[Chrome Store](#)

Number Pieces

Number Pieces helps students develop a deeper understanding of place value while building their computation skills with multi-digit numbers. Students use the pieces to represent multi-digit numbers, regroup, add, subtract, multiply, and divide.



[Open Web App](#)
[Apple App Store](#)

Number Pieces Basic

Number Pieces Basic is a simplified version of Number Pieces. It has fewer features, putting greater focus on place value, counting, addition, and subtraction with multi-digit numbers.



Number Rack

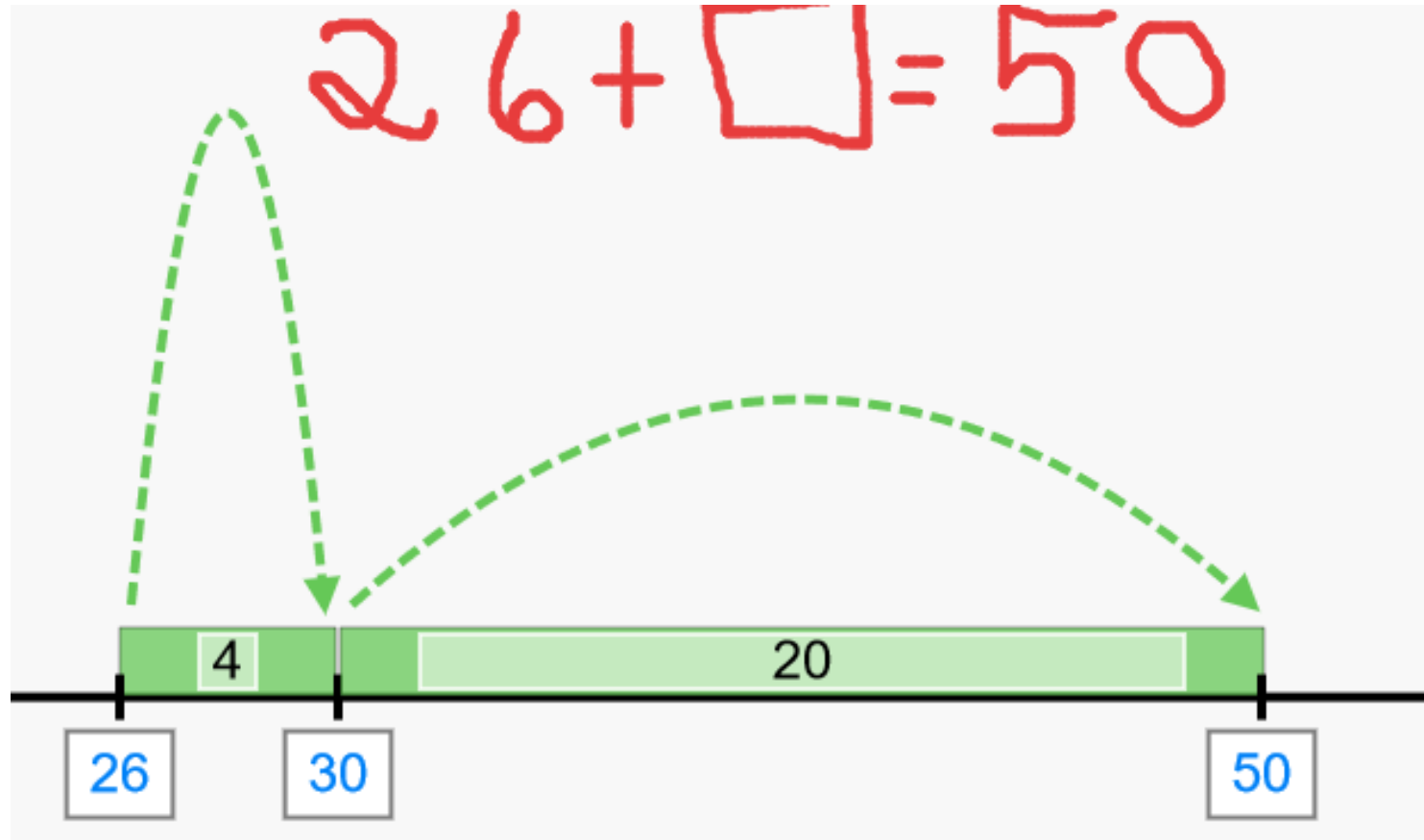
Number Rack facilitates the natural



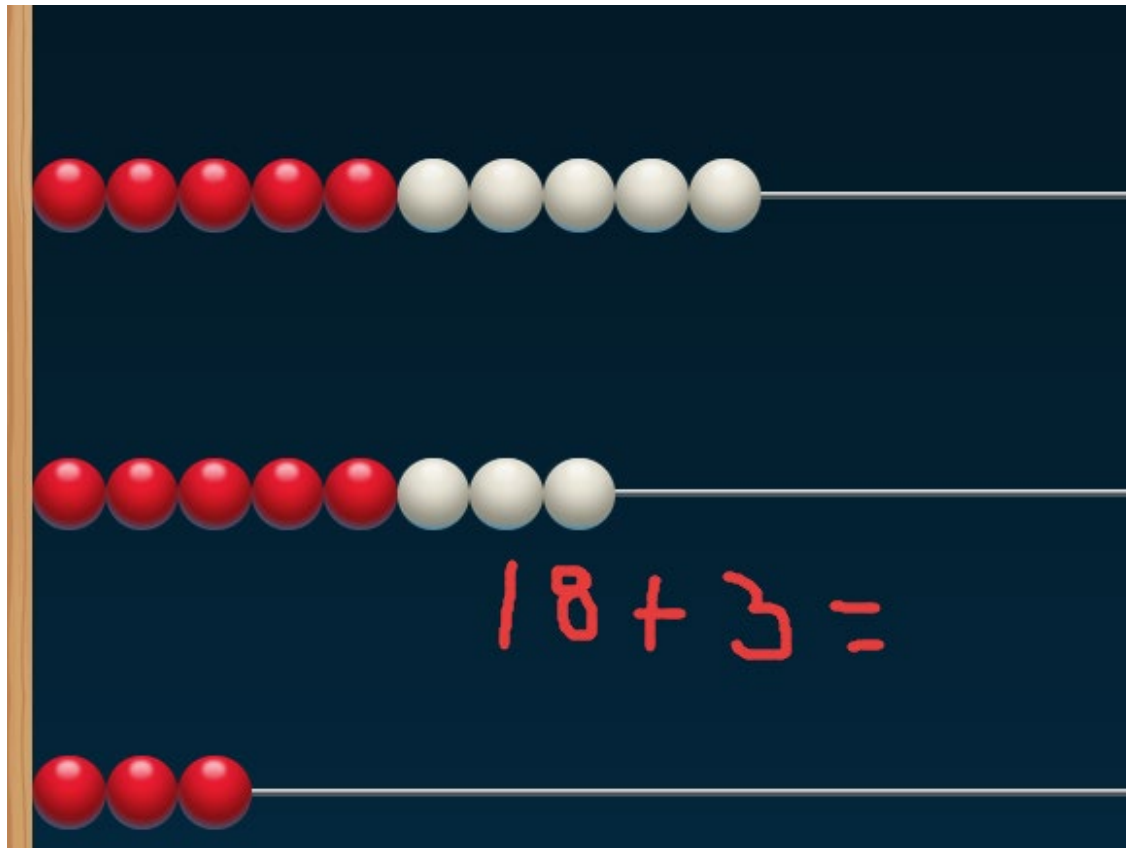
Pattern Shapes

Students use Pattern Shapes to explore

Number Line app



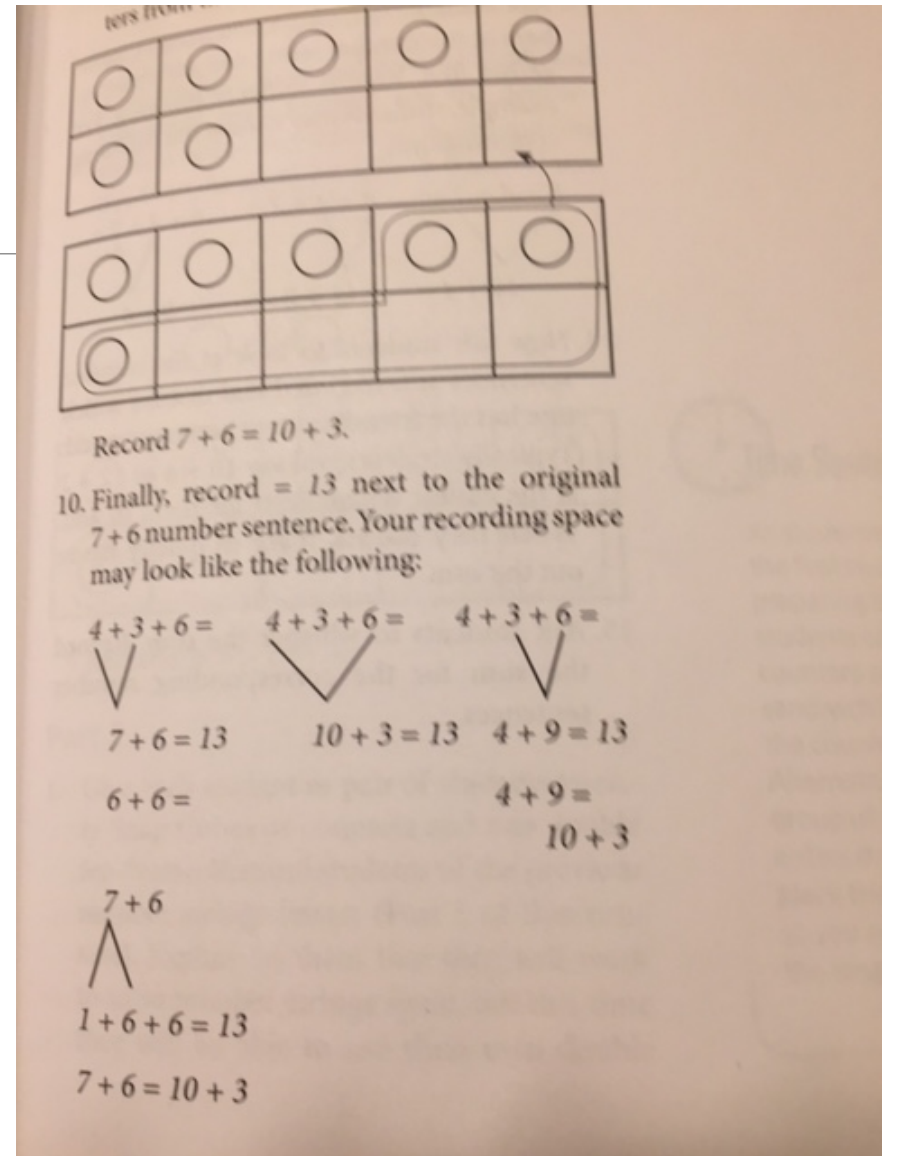
Number Rack app



It Makes Sense!

Using Ten-Frames to Build Number Sense by Melissa Conklin, published by Math Solutions

Each Routine, Game, and Problem is linked to CCSS Grades K-2



Elementary Mathematics Project (EMP)

NSF-funded project out of Boston University whose overarching goal is to develop and disseminate learning materials that strengthen **pre-service elementary teachers'** understanding of mathematics



Addition & Subtraction

The Addition & Subtraction unit consists of 7 mathematical lessons focused on the addition and subtraction operations . Topics studied include addition and subtraction story problems, addition strategies and algorithms, subtraction strategies and algorithms, and addition and subtraction of decimals. There is significant attention placed on number decomposition, number line modeling, and the arithmetic properties throughout the unit.

Turn to a someone you do not know and share your responses to the following:

What resources do you recommend in the teaching of structuring of numbers?

What are your recommendations for additional resources for Mathematical Settings?

Recommended Websites and Resources

Purple book - www.sagepub.co.uk/wrighttnc

White book - <https://study.sagepub.com/wrightLFIN>

It Makes Sense! Using Ten-Frames to Build Number Sense -
<https://store.mathsolutions.com/it-makes-sense-using-ten-frames-to-build-number-sense-grades-k-2-220.html>

Bridges is a PK–5 curriculum, the Resources include 10 free apps that are available for Chrome, Apple and Web based <https://www.mathlearningcenter.org/bridges>

Plickers is a formative assessment tool - <https://help.plickers.com/hc/en-us>

The Elementary Mathematics Project (EMP) - <https://elementarymathproject.com/>

Thank you for coming

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<http://web.mnstate.edu/harms>