DLM Webinar
Counting and Cardinality
&
The Power of Ten-Frames

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Today's Plan

- Overview two modules:
  - Counting and Cardinality
  - The Power of Ten-Frames
- Link to key resources on the DLM Educator Resource Page
- Questions & Answers

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Why Start with Counting and Cardinality

All other mathematical understandings are based on the students ability to think flexibly about numbers.

The Five Elements Needed

- Number Name & Identification of Numerals

- Counting Collections → Tactual

→ Visual

- Making Collections → Virtual

- Comparing Collections

- Count to Tell "How Many"
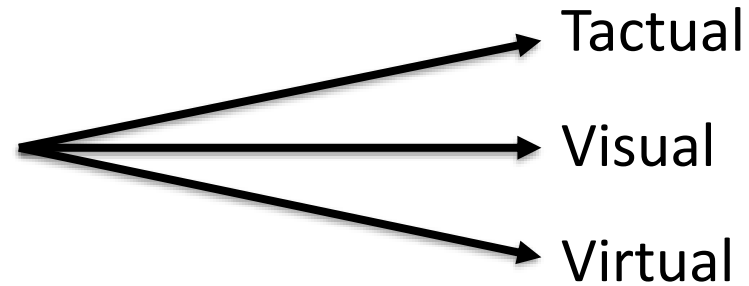
All Taught in Context

These five elements build off of one another. As student understanding increases in one element it creates understanding in the other elements.

Teaching these elements in isolation may increase procedural knowledge but it does not necessarily build conceptual knowledge.

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Imbedded Across Essential Elements

- M.3.OA.4 Solve addition and subtraction problems when result is unknown, limited to operands and results within 20

- M.EE.7.G.4 Determine the perimeter of a rectangle by adding the measures of the sides

- M.EE.S-ID.1-2 Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret data

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Collections

Students need lots of experience with counting to

- learn which number comes next
- how the number sequence is related to the objects in front of them
- how a keep track of which ones have been counted

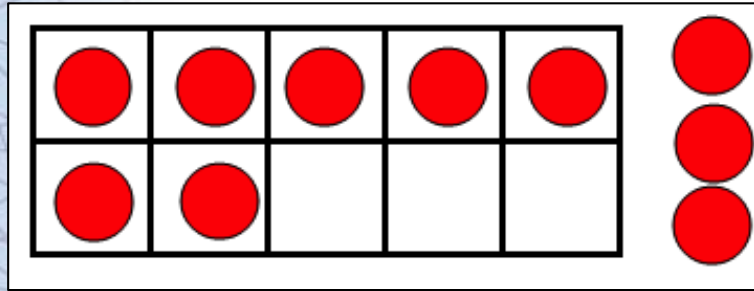One way to help students with this process is to provide **visual and tactual models.**

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Visual, Tactual, & Virtual Models
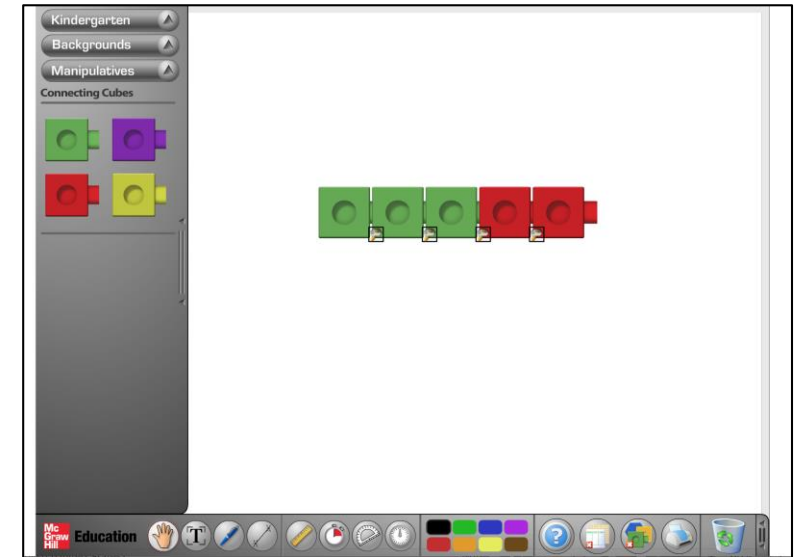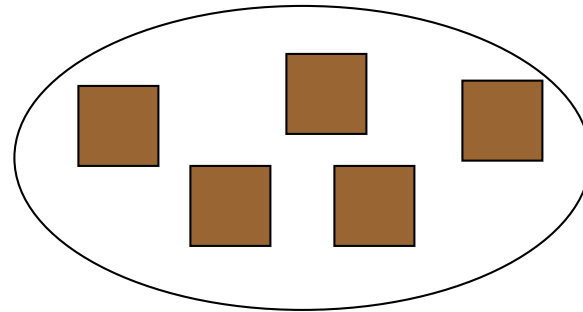
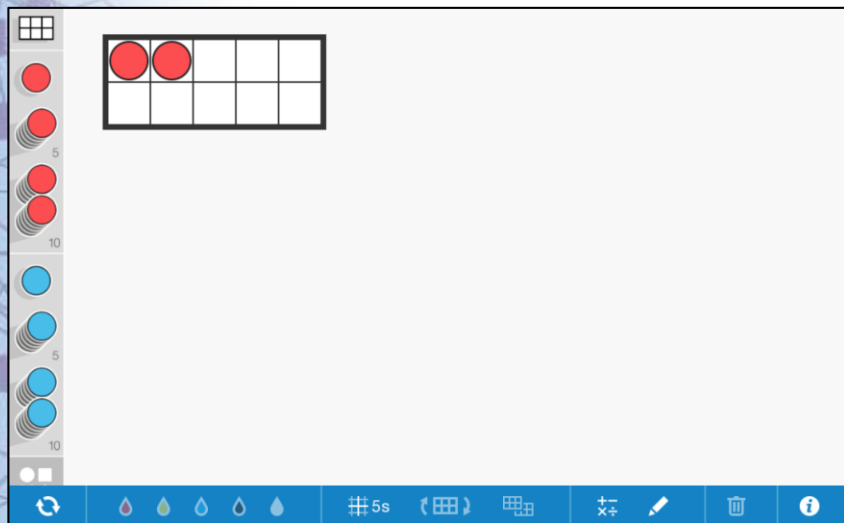http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html

The Ten-Frame

A separate module was devoted to this visual/tactual/virtual representation of number because it is so rarely used with students with significant cognitive disabilities.

Ten-Frames

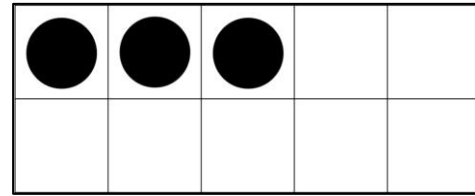Paper Ten-Frame

Online Interactive Ten-Frame
https://apps.mathlearningcenter.
org/number-frames/

Life Size Ten-Frame

Boxed Ten-Frame

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Uses for the Ten-Frame

- Counting

- Cardinality

- Comparing
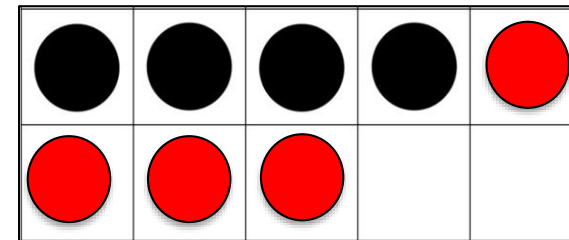
- Composing and Decomposing

- Building Base-Ten knowledge

One, two, three.
How many?
Three

Not all

7 is two more than 5
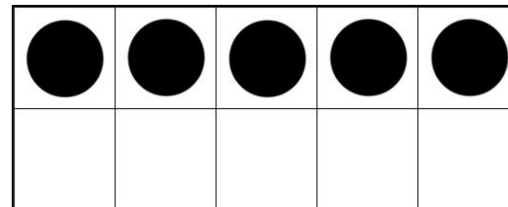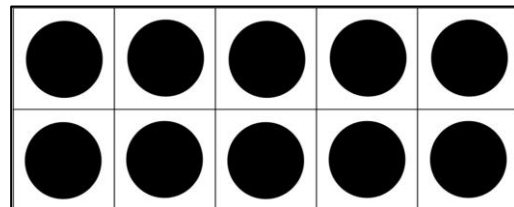
Initial and Distal Precursor

- Provide a clear connection between the Initial Precursor and Distal Precursor linkage levels and the Target linkage level, teachers can better tailor classroom instruction for each student.

- https://www.dlmpd.com/wp-content/uploads/2017/04/Initial-Distal-Precursor-Extended-Descriptions-Math-1.pdf

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M.3.OA.4 Solve addition and subtraction problems

Initial Precursor: Understanding how to add and subtract requires a student to be able to recognize that two or more sets or groups of items exist. Teachers can work on this skill using a variety of sets. Teachers should help students recognize when items are grouped together into a set or separated out. As teachers present a set, they should label it (e.g., two balls, one bear, three blocks), count the items, label the set again, and encourage students to use numerals to label and count the separate sets.

Distal Precursor: As students begin to understand labeling and counting small sets (1-4), they begin to use the number sequence. Students become more adept at tracking individual objects and are able to compare (e.g., more or less) two groups based on the overall area or discrete number. Again, teachers can work on this skill using a variety of sets, labeling and counting the set, and moving items in and out of the set, labeling and counting the set again.

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Counting and Cardinality

Online Self-Directed Module

https://unc.az1.qualtrics.com/SE/?SID=SV_2aYT1qQvStwLxt3

Facilitated Module Materials for Groups

https://www.dlmpd.com/counting-and-cardinality/

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The Power of Ten-Frames

Online Self-Directed Module

https://unc.az1.qualtrics.com/jfe/form/SV_cwicpSlufxF4YiF?Q_JFE=qdg

Facilitated Module Materials for Groups

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THANK YOU!

For more information: www.dynamiclearningmaps.org

For Professional Development:

www.dlmpd.com